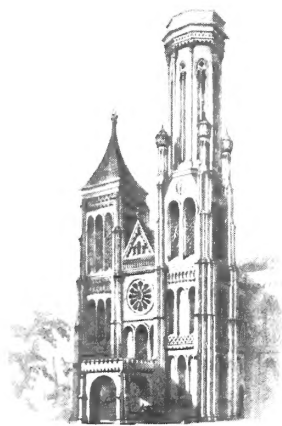


FLORA AND SYLVA

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FLORA AND SYLVA.

A Monthly Review for Lovers of Garden, Woodland, Tree or Flower; New and Rare Plants, Trees, Shrubs, and Fruits; the Garden Beautiful, Home Woods, and Home Landscape. Edited by, and Printed and Published for, W. Robinson, Author of "The English Flower Garden," "Alpine Flowers for Gardens," and "The Wild Garden."

VOL. I.



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1903.

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December 1st, 1903.

WITNESS of the hot chase after process illustrations, small type, tin-shine paper, smudge lithographs, tomb-stone weights, and the less delightful features of modern books, the spirit of old things began to move in me and led at last to my going to the printer, who did not at first see my meaning. So I went home for Baskerville's Virgil, and asked him to get as near to it as he could in type, went with flower drawings to the best colour-printer in Europe; to the paper mills that still make real paper, and found surviving a wood-engraver who understood my good artist's drawings, and so began.

As regards the plan of FLORA AND SYLVA, it struck me that periodicals of this kind had always been over much devoted to flowers and plants as distinct from trees and shrubs, while every day of my life I see more and more the beauty and value of the tree. So I married FLORA to SYLVA—a pair not far apart in Nature, only in books. The flowers are as the lovely clouds that pass over an alpine range, the trees as the cliffs and mountains that remain.

When we think of the beauty, use, and long life of trees, and the happy results a man who plants may get in his own lifetime, there can be but one view as to the importance of the subject, and hence the place given them in this work. In the series of articles on the Greater Trees of the Northern Forest it is proposed to include all the nobler trees.

W. R.

Gravetye Manor.

“ You work for God—fellow-workers, as it were, with the divine forces of Nature. God, in his changeless working, reckes not of our fantasies : Nature will have none of our false systems. She is supreme, absolute as is her Author. She repudiates our foolishness, and rudely dispels our illusions. Work with her and she responds, aids, and rewards us in proportion to the worth of our endeavour ; but if we would outwit her, coerce or restrain her action, and falsify her teaching, at once she gives us the lie by the sterility, destruction, and death of everything we have sought to create in defiance of her laws.”

—LAMARTINE (Address to Gardeners).

FLORA

AND SYLVA.

Vol. I. No. 1.]

APRIL, 1903.

[Monthly.

HARDY BAMBOOS IN ENGLAND.

TWELVE winters, and, which is perhaps more to the purpose, twelve summers, with what Sidney Smith called "their usual severity," have come and gone since a few enthusiasts, following in the wake of Lord de Saumarez, began to plant hardy Bamboos in their pleasure grounds on a scale which was at that time quite a novelty. It is true that a few species, such as *Thamnocalamus falcata*, *T. Falconeri*, and one or two others, had for some years been cultivated in Cornwall, in the West of Ireland, and in some other places. Loudon, in his second edition (1854), says: "There are two kinds of Bamboo in the Horticultural Society's Garden which have endured the open air for ten or twelve years without any protection whatever. One of these, *Bambusa nigra* (Lodd. Cat.), the Black Bamboo, was, in 1837, 7 feet high, with several stems varying in thickness from $\frac{3}{4}$ to 1 inch. Though a native of India (!) it appears nearly as hardy as the European Reed. Another species in the same garden, *B. arundinacea*, has stood out during the same period at the base of a wall with an eastern aspect, but has not grown so freely, probably owing to its being in a drier soil." We have gone ahead since Loudon's time, and there are now in cultivation in the Midlands of England exactly fifty species and varieties, three of which come from the Himalaya mountains, growing at high altitudes, one from the United States of America, and the remainder from China and Japan.

It may be interesting to place on record the behaviour of these colonists in their new home, the more so inasmuch as during the greater part of their exile they have had to contend against climatic conditions which were anything but favourable to their development. It must always be borne in mind that in their own country the season of heat is also the season of rain. With us that is not the case, the autumn and winter, when the Bamboos are at rest, being the wetter period of the year. Indeed, many of the summers which they have experienced here have been periods of great drought, when wells have been dried up, springs have failed to run, and, in some places, water for domestic purposes has been sold at so much a bucket. In spite of all adverse circumstances, the Bamboos

have held their own, and have grown with a luxuriance quite in excess of what could have been hoped for.

The summer of 1902 has subjected them to a new trial. Although the rainfall has been short it has been well distributed, and at no moment have the Bamboos suffered from want of moisture. On the other hand, there has been little sunshine, and it is the combination of heat and rain which causes these lordly grasses to grow to such superb dimensions in their native land. Some of them, indeed, have made extraordinarily conspicuous growth. *Arundinaria japonica* (Métaké), *A. Simoni*, *Phyllostachys nigra*, *P. Boryana*, *P. Henonis*, and some others have sent up shoots higher by a measurement of from 3 to 5 feet than those of previous years, and it is fair to suppose that the growth of the underground stems or rhizomes, bearing the buds which will give us next year's canes, will have been proportionately vigorous. The question is, will these growths, above and below the ground, have ripened sufficiently in the absence of genial sunshine to enable them to resist the trials of the coming winter? One feature of this last summer has been the tardy development of plant life. Almost all flowers and fruits have appeared from a fortnight to a month behind their usual time, and the Bamboos have formed no exception to the rule. *P. Quilioi*, for instance, which is always one of the last to send up its shoots, is altogether behindhand. Many of the stems have not yet (November) developed their terminal leaf, and their topmost branches are still closely pressed against the main culm. In that condition the first severe frosts cannot fail to shrivel them up. In the case of the *Arundinarias* I have noticed that the stem may be reckoned safe when once the terminal leaf of the main stem has been developed; but the *Phyllostaches* are different; in their case the terminal leaf of every branchlet must be matured for the culm to be out of danger.

The coming winters may therefore teach us some rude lessons. Not that I anticipate any danger to the plants themselves, but those late shoots which the cold, ungenial summer has failed to tempt out of the ground in proper time, will probably fall victims should we have any severe weather. I shall be much surprised if *P. Quilioi* and its near relations *P. Castillonis* and *P. Marliacea* do not suffer in this way. And the pity of it! For, so far as my experience goes, *P. Quilioi* always looks as if it ought to be so much better than it is. Its sluggard habit of putting forth its shoots late in the season, often not till the latter half of September, causes many a promising culm to wither and perish by an untimely death. But for this drawback it would be by far the largest of our Bamboos, and, even so, culms 18 feet in height, with a diameter of an inch and a half, are not uncommon.

For the same reason *P. mitis*, which is such a feature in the gardens of the Riviera, is a disappointment in the Midlands of England. Occasionally a fine

stem will push its way through the earth early in the year ; but a large proportion of the growth comes too late, and cannot ripen in the feeble autumn sun. It is, perhaps, for this reason that the canes have a provoking trick of breaking off at the roots, causing a great disfigurement and untidy appearance in the plant. Their graceful habit is the great charm of the Bamboos, and no plant can be called graceful which is apt to sprawl about with prostrate culms.

Very different is the behaviour of the lovely group of *Phyllostaches* which is made up of *Boryana*, *nigra*, *nigro-punctata*, *Henonis* (all apparently closely allied), and *viridiglaucescens*. As soon as the spring has released the earth from its bonds, these begin busily to bestir themselves. At the end of April or beginning of May, and sometimes earlier, the little cones are seen to pierce



THE PALMATE BAMBOO AS AN EVERGREEN WATERSIDE COVERT PLANT.

(Engraved for "Flora" from a photograph after Nature. Sussex, January 1903.)

the surface of the soil ; development takes place under the most favourable conditions, so far as heat is concerned, that our summer affords, and the August sun ripens the wood. As a natural consequence, we may reckon with all faith upon the ultimate result. But there is one precaution which must not be neglected if we desire to see the nodding plumes at their best. While the culms are growing, until the terminal leaf and the upper branches have all matured, they are so brittle that a touch will almost break them, and a very slight breeze will make the old stems flog the young ones until they are all lashed into strings and threads. In order to avoid this it is necessary to tie the young culms to

the old ones, so that when the wind blows the whole plant may sway gently backwards and forwards in one mass, instead of its swirling round and round in suicidal gyrations.

The *Arundinarias* take better care of themselves, and need little or no attention, but the *Phyllostaches* bruise themselves cruelly, and, unless they are most carefully nursed and supported, the whole growth of a year is apt to be lost, to the grievous disappointment of the cultivator. He thinks that his plants are well sheltered, but, be they never so well masked, an envious wind will drive its gusts curling round the corner with havoc and despair in its train.

He who would grow Bamboos and show them successfully must have a care for four things :—

1. Background to show off their many graces ; and for this purpose I know nothing better than a clump of Hollies.
2. Shelter from wind, and in this I include the precautions indicated above while the young canes are yet *in statu pupillari*. Frost may be laughed at ; but the insidious attacks of wind are deadly.
3. Manure. This can hardly be given in too large doses. Your Bamboo is a hungry feeder, and if he is to grow fat and well-liking his commons must be of the best. It is wise to give plenty of manure in late autumn : in that way root-growth is promoted and protected. A good mulching of leaves is wholesome, to keep the moisture in, and the frost out.
4. In the summer, if rain be absent, artificial watering is essential so long as growth is going on.

These are the cardinal points to be observed in cultivation.

Two questions are, very naturally, constantly asked : (1) Which are the best Bamboos for cultivation in England ? (2) To what size do you expect your Bamboos to grow ?

The first of these questions is easily answered. In the first place, I should say, for very small gardens no Bamboo is really suitable. If they are to thrive they must not be cramped for space ; the healthier they are the more will they invade the adjoining territory, ruthlessly removing their neighbour's landmark. I have seen *Bambusa pygmæa* recommended in nursery gardeners' catalogues as edging for beds. All I can say is, Heaven help its bedfellows !

For fair-sized gardens such plants as *A. nitida*, *P. Boryana*, *P. nigra*, *P. Henonis*, and *A. auricoma* are real treasures. *A. japonica* or *Métaké*, *A. Simoni*, *P. viridiglaucescens*, and *P. violescens* are only suited to large, wild gardens. In the formal garden they are quite out of place. Their rampant nature demands full liberty. Bounds are odious to them. It is miserable work to see oneself forced to curtail a plant just when it is beginning to show itself at its best. *A. Veitchii* I have been obliged to eliminate even from the wild garden, and am

planting it out as undergrowth in woods, where it will, no doubt, make excellent covert for foxes and pheasants. The same fate awaits *B. palmata*, which is growing quite out of hand. Other desperate land-grabbers are *P. fastuosa* (except in stiff clay soil) and *B. quadrangularis*, both of which are quite unsuited to a middle-sized garden. A good thing in the wrong place becomes a bad thing: who shall defend the persistent planting of Wellingtonias and Araucarias in suburban villa gardens which you might cover with a decent-sized table-cloth?

In planting Bamboos, then, it is necessary that attention should be paid to the size of the garden and the habit of the particular species, otherwise they are best left alone.

The question as to size calls for an answer which is akin to prophecy, the danger of which is notorious. I cannot call to mind a single season during the last twelve years which could be said to be really propitious to Bamboo culture. As I pointed out at the beginning of this paper, we have had successions of drougthy summers, during which hand-watering has been enforced, and the bucket is never so good as the rain-cloud. More especially is this inferiority patent where the water heavily charged with lime is so hard that for domestic purposes it must be artificially softened. In spite of this the plants have gone on growing by yearly increments. Had the summer of 1902 been a little warmer, the result would doubtless have been very different. Perhaps some day we may get "a dripping June," which, being also genial, may "set all things in tune," and when there may be warm instead of cold showers. If so, that will be the test year. We know not what the future may have in store for us.

In any case we have now canes of *P. Quilioi* 18 feet high; *P. Boryana* is growing vigorously at a height of 17 feet 6 inches; *P. Henonis* and *P. nigra* are nearly as high; and a Bamboo of that size with its perfect grace is a most beautiful sight in the wild garden. Forests of Bamboos we may not have; but if they are not to take their place in the Sylva, no one can deny that the Flora is greatly the richer for their presence.

Some years ago one of the principal cane and umbrella makers in London assured me that we should never be able to grow a Bamboo that should be tough enough to make a walking stick. The canes would all split and be useless. He was wrong. This year I took him two canes of *P. nigra* to mount, and he was obliged to confess that he had never seen tougher or better-coloured specimens. It does not follow from this that the cultivation of Bamboos for such purposes can be commercially profitable: in fact, it is impossible. In the first place, canes can be imported from the Far East at a ridiculously low cost, and, in the next place, the development of the plant is too slow. To cut from a twelve-year-old plant two canes intrinsically worth two or three pence each, can hardly be deemed a gigantic commercial success.

When, some years ago, I published "The Bamboo Garden," I examined at some length the interesting question of the flowering of the Bamboo. I endeavoured to show that the commonly received belief, endorsed by eminent botanists, that the Bamboo of necessity, and invariably, dies after flowering, was based upon imperfect observations. I brought forward some evidence for refusing to accept an article of faith in support of which, as it appeared to me, very insufficient proof had been adduced. Since then my heterodox opinions have been confirmed by the phenomena which we have been able to observe in several species in this country.

Up to that time four Bamboos had been observed to flower in Europe—*A. japonica* (*Métake*), *A. Simoni*, *A. Falconeri*, and *P. flexuosa*. In all these cases the plants, though greatly weakened by the effort, survived. Since then *A. Laydekeri*, *A. auricoma*, *P. nigra*, *P. nigro-punctata*, and *P. Henonis* have flowered in this country. In the case of *A. auricoma* only a few culms flowered, but in the others the inflorescence was profuse. *A. Laydekeri* and *A. Simoni* ripened their seed in the garden, and the seed germinated, producing young plants which are now thriving side by side with the parent clumps. So far as my observation goes, the remaining species, although they produced their flowers in great abundance, failed to give any seed: probably needing more sun than our climate affords.

The two Bamboos which, in my garden, have shown the greatest amount of flower are *P. nigra* and its variety, *nigro-punctata*. Of the latter variety every plant was, two years ago, in 1901, smothered with bloom, and a few plants flowered less abundantly in the previous year. In the case of *P. nigra*, only one plant out of a very large number is dead: in the case of *P. nigro-punctata* the death-roll has been larger; but many plants have survived, and will doubtless recover, for they are putting forth new shoots, though very much weakened, and, for the present, stunted in growth. The individual stems that flowered are almost all dead.

A. Laydekeri, *A. Simoni*, and *A. auricoma* are none the worse for the effort, though the two former have flowered for three or four years in succession.

To what conclusion, then, are we to arrive in respect of this old belief as to the fatal consequences of flowering? Is it not probable that inasmuch as there are two classes of Bamboos, the one with cæspitose, or tufted roots, the other with running rootstocks like couch-grasses, death of necessity ensues with the former, whereas it is not so in the case of the latter? He would be a bold man who would contradict the statements of the great men of science, such as Humboldt, Hooker, Roxburgh, St. Hilaire, and others. They must have seen some Bamboos die after flowering. On the other hand, it is impossible to refuse the evidence of our own eyes. Possibly they came rather hastily to the

conclusion that death follows flowering in the case of all Bamboos. I venture to hazard the guess that it may possibly be confined to that of the cæspitose species. It certainly would be difficult to exaggerate the vitality of the rhizome of couch-grass; and, after all, these beautiful plants are, structurally, Titanic couch-grasses.

At any rate, we have now certain data to go upon, and the question will be settled by some judge more competent than I am to pronounce a verdict.

It would be sad indeed if we knew beforehand that at some given period, uncertain as all life, to-day, to-morrow, or years hence, our gardens must be shorn of the beauty which we have taken such pains to add to them, and that our Bamboos must die in a supreme effort—vain, probably for the most part, in this climate—to reproduce their species.

As to the rarity of the flowering I may perhaps quote what was said by a friend of mine, a botanist and Fellow of the Royal Society, who was paying me a visit: “I have travelled the wide world over, and been much in the homes of many Bamboos, but not until I came to these Cotswold Hills did I ever see one in flower.” His amazement knew no bounds.

But, apart from all scientific interest, it is no small gain that we have achieved in adding to our gardens fifty members of an exceptionally beautiful family. In all the lovely flora of China and Japan there is no plant the grace of which has been a greater source of inspiration to the poet. “How can I live for a single day without this gentleman?” exclaimed the famous poet, Wang Hai Chin; and so struck were the Chinese by these words that “this gentleman” is now the familiar name for the Bamboo amongst persons of education. But not only the beauty but the extraordinary usefulness of the Bamboo has become proverbial. And so it is said, “You may eat your meals without meat, but you cannot live without a Bamboo.” What higher praise may be given?

REDESDALE.

THE MUME OR JAPANESE APRICOT (*Pyrus mume*).

THIS very pretty *Pyrus* was brought from Japan in 1878, and has not as yet received sufficient recognition on the part of planters. At this date, the second fortnight in February, it is charming with its branches laden with pompon roses or peach blossoms, single and double, white, carnation, red rose, lilac and garnet. The double-flowered kind is very attractive from all points of view. The blossoms appear simultaneously with the *Lonicera fragrans* and *Standishii*, *Daphne*, *Chimonanthus fragrans*; when *Jasminum nudiflorum* is going out of flower, and the bell-shaped blooms of *Forsythia* are turning to lemon yellow. My friend Mr. Hayato Foukouba, director of the Mikado's gardens,

tells me that the approaches to the towns in Japan planted with Mumes are an attractive resort, owing to the early blooms and the delicate perfume of the trees. Generally the single-flowered kinds have a more slender port; their fruit has the size, form, and colour of the apricot. The so-called “Bungo Mume” bears very large fruit, whilst the fruit of the “Shinano Mume” are very small. Japanese housekeepers preserve the fruit. Here the double-flowering rose Mume gives us fruit of average size, with the appearance of an apricot or peach and half the size.

CHAS. BALTET,
Le Jardin.

NEW AND BEAUTIFUL DAFFODILS.

THE Daffodil Exhibitions of 1902 were remarkable for the quite exceptional number of new and fine varieties of *Narcissus*, the fascinating and variable flower of which the hybridization has afforded an admirable field for skill and technical knowledge of a very high order. Much has been done in this line during the last thirty years or so, and it is by no means too much to hope that we shall enjoy many more surprises and delights in seasons still to come, even if we do not live to see a scarlet trumpet Ajax Daffodil.

*New and beautiful
Daffodils.*

People are often heard to condemn and grumble at the price of most of the recent fine introductions, but such persons are probably unaware of the patience and ability required to produce a fine seedling Daffodil. From six to seven years the raiser must wait, after he has sown the seeds, to see the bulbs flower; and then follows the slow process of propagation from natural subdivision. Later on, if any of the blooms have unusual merit, they are exhibited, and competition for the bulbs of anything really fine runs up the price. So many persons keenly desire a bulb to add to their collections—and there are not quite enough bulbs to go round—that the hybridizer, who has evolved one success from among thousands of seedlings discarded by his fine discernment, obtains a well-earned reward. It seems churlish to grudge this to anyone who permanently enriches a class of early and hardy flowers. High prices seem seldom objected to when given for orchids, but surely it is more worthy to multiply the treasures of the hardy garden than those of glass-house culture.

In the beautiful class of self-yellow trumpet Daffodils the advent of King Alfred marked a great advance. A noble, upstanding flower as one looks at it in the sunlight, it seems as if hammered out of pure gold.

*Self-yellow
Trumpet Daffodils.*

It is entirely free from the slightest reproach of coarseness or imperfect form, and its great height, and exact proper proportion of perianth and trumpet, flower and foliage, place it in the very foremost rank of excellence. Monarch, another fine self-yellow, is also full and stately. Some monster blooms have come from Holland, the best of which are Glory of Noordwijk, Queen Wilhelmina, Von Waveren's Giant, Rembrandt, and Teniers, but they cannot enter into comparison with such a flower as King Alfred. In most, if not all of them, there is a want of balance between their stature and the size of their blooms; and they cannot be said to be free from coarseness. Some advocates of these flowers have suggested that they may come taller in English gardens; but, as this has not been the case with older dwarf, large-flowered Dutch forms, it seems a scarcely probable development. Lord Roberts and Cleopatra are new varieties of solid merit, the latter showing some advance on Emperor. The raiser of King Alfred, Mr. P. J. Kendal,

showed some further seedlings this year, the best of which were Queen Alexandra and Sir Francis Drake, but neither approached King Alfred in importance. Golden Bell is a charming early flower with pale, broad, yellow perianth, and a very large deep-golden trumpet, finely recurved and frilled.

Among bicolors, Ellen Willmott and Weardale Perfection are still unchallenged as to first place in merit, but for some mysterious reason of the season the spring of 1902 was unmarked by the display of such fine blooms of Weardale Perfection as were seen in 1901. A beautiful bicolor, Mrs. Hillhouse, was shown at Birmingham, and deservedly admired. Other first-class bicolors are Duke of Bedford and Mrs. Morland Crosfield.

Daffodils with white perianths. A considerable number of new and very interesting flowers have been seen this season in the section of Daffodils with white perianths, and white, or pale primrose, or palest apricot trumpets. Until these flowers have become more common—which is unlikely to happen very soon, as extremely few bulbs of many of the finest varieties are yet in existence—it will be difficult to judge fully as to their respective merits. The beauty of some of the flowers of this class is much enhanced if grown under glass or closely shaded, but until they are seen growing in the open we shall not be able to feel certain that the refinement and beauty of tone we have noted in the exhibited flowers will be found in equal perfection under ordinary culture. None of the new white trumpets have won more admiration for size, form, and colour than Peter Barr, worthily named after the veteran Narcissus grower. Other fine flowers of this class are Queen Christina and Lady Audrey; the former has a yellowish tinge in the trumpet, that of the second named is paler. Mr. Engleheart has produced many beautiful flowers with trumpets, some of which he has named after Italian cities: Verona, Genoa, and Venice are among the best. Beautiful as are the new flowers just enumerated, they supplement but do not supersede older varieties of such established merit as Madame de Graaff, Mrs. Thompson, and Cernuus pulcher; while for perfect purity of whiteness and elegance of form the delicate little Irish flower, Colleen Bawn, so fickle and difficult to grow in perfection, has no rival.

Newer Daffodils. Among the newer Daffodils in the Incomparabilis section there are many flowers of great excellence and refinement, and the red cups are a very strong company, deservedly prized for their brightness and the vivid colour they impart to the spring garden. Those who only see these flowers in vases at a show have little idea of the splendid effect of a large clump or stretch of such flowers as Lucifer, Lulworth, Gloria Mundi, Vesuvius, or C. J. Backhouse.

A few flowers were shown this season of the rare and highly-prized Will Scarlet, which boasts the largest fiery chalice of all the red-cups. Flambeau,

Flamingo, and Torch are all magnificent flowers, showy, and of good constitution. Topaz is elegant and refined, with a long glowing orange-red cup and white perianth. Firebrand has also the perianth white, with a cup of perhaps the deepest, most flaming colour yet attained. Some pretty flowers were exhibited at various shows with cups of peach, apricot, and salmon tints ; perhaps the best was named appropriately Peach. Salmonetta at Birmingham had attractive colour, but lacked form and substance. Lady Margaret Boscawen is still well in front among the giant Incomparabilis blooms. Mr. Engleheart has also shown a very fine flower in Noble—deep yellow and saffron. Brigadier has also high merit.

The Leedsii section, one of great beauty and charm, has been very strongly reinforced. Robert Berkeley and White Queen, so much alike that it requires a most expert eye to detect any difference, are both of them flowers that seem quite faultless in size, substance, form, colour, and finish. The perianth is all that can be wished, and the cup a marvel of refined beauty, tone, and modelling. The power of the hybridizer is great, but if Mr. Engleheart can produce anything of their class to surpass these two splendid flowers it will be little short of a marvel. Maggie May is also a very beautiful thing, and with Ariadne and White Lady will be a standard flower. The twins Seagull and Albatross are, as their names suggest, grand white-winged spreading flowers, tall and robust. The cup of the former is of a bright canary-colour, edged apricot, while the latter has a deep rim of orange-scarlet.

The Burbidgei group of Daffodils has obtained a much-needed strengthening by recent introductions, some of which have flat coin-like cups, though “cups” is hardly the word, for “saucers” more nearly describes their form. It may possibly be necessary for the experts among our Narcissi authorities to look over, and pronounce upon, the classification of many of the new hybrids which are matters of some doubt. At Birmingham Mr. Engleheart showed a superb flower, Astrarderate, in the very large “saucer” of which flame-colour was beautifully radiated. He had also three lovely varieties in Egret, with its perfect smooth white perianth and broad fluted flat cup ; Rosalind, also white in the solid perianth, and with the cup richly edged orange-scarlet ; and Vivid, a very pleasing flower, with a harmonious glow throughout, and a cup very fiery in colour. Blood Orange was seen to advantage at Birmingham, and Imogen and other new flowers lent much interest to this improved class.

In the Poëticus section, too, the hybridizer has done much good work, and the progress is of great advantage. We have now flowers of exquisite fragrance in which the best qualities of the parent plants are happily united. Some of these are as early as Ornatus, others

come a little later. Epic and Cassandra are stately and exquisite forms, perfect in colour and symmetry. Laura, Virgil, Chaucer, Shelley, and Dante are all excellent in their several ways, and Glory, a somewhat late flower, is also fine. Horner, though an exceptionally large and good flower, seems to share with some others of its class a want of strength in the stem, which has been described as bending like a fishing rod. Possibly this is only the result of unfavourable conditions of culture; for certainly in one or two cases, newly-obtained bulbs of seedling Poëticus, when grown for the first year, produced flowers that showed this "fishing-rod" defect very much. But it was not observable in the second or subsequent seasons, owing possibly to more favourable soil and climate. Mr. Engleheart has also brought out some double flowers, which are useful because of their strong stems. Everyone who has witnessed the havoc that a little rain and wind can make with most of the old "doubles" will realise the merit of double flowers which have a strong upstanding habit. Plenipo is a double sulphur, and Argent, as its name suggests, is mostly white, with some primrose petals, and an attractive symmetry of form. Primrose Phœnix, a flower from Ireland, is very fine, of large size, and a clear self primrose.

Any notice of new Daffodils would be very incomplete if it contained no mention of the many fine exhibition Daffodils, as well as interesting and rare forms of the flower, shown from time to time on the Narcissus Committee table in London and at the Birmingham shows by Miss Willmott, whose collections at Warley simply embody the whole history and science of the flower. Among her important contributions during the last couple of years may be named Earl Grey, Countess Grey, Robert Berkeley, Charles Wolley Dod, Betty Berkeley, Warley Magna, Incognita, and those brilliant flowers Oriflamme and Cresset.

F. W. CURREY,
Lismore.

HARDY FRUITS OF THE LYONS REGION.

By FRANÇOISQUE MOREL.

THE geographical and agricultural region which surrounds Lyons is one of the most propitious in France for good fruits. They are favoured in their growth and maturity by a certain equable distribution of sun and rain, of warmth and moisture, which has no existence in the north nor in the south, and which permits of the ripening out of doors, without any sort of shelter, of the finest peaches, the most delicate nectarines, grapes that are golden in berry, crisp and juicy—choice fruits that could not bear the ardent sun and the long droughts of our neighbour La Provence, and that in northern climes are only to be grown on espalier against a well-exposed wall. Our industrial population know how

to profit by these favourable circumstances; cherries, apricots, pears, peaches, and grapes are largely cultivated for the markets and exported in important quantities. The cultivator has not been content merely to select the varieties that sell best; he has embarked on the conquest of new kinds. He has succeeded, thanks to the discovery of chance varieties, but more frequently as the result of intelligent hybridizing, in increasing to an extent of which this article is intended to give some idea the resources bequeathed to him by his predecessors. Societies have been formed, uniting interests and efforts in a common bond for spreading useful knowledge in regard to fruit culture, and encouraging and

rewarding research and improvement. The Société pomologique de France, founded at Lyons half a century ago, is distinguished above all others for the character and extent of its service to the cause. It has rescued out of chaos the nomenclature of fruits, simplified their synonymics, and has extolled what is best among them in a work bearing the name of *Catalogue des Fruits adoptés par la Société pomologique de France*. The enumeration which we are now about to make of the varieties of fruits born, discovered, or evolved in the Lyonnaise takes this catalogue for its basis. I begin with the Pears, as having an importance in alimentation and domestic economy first among all fruits, and as being the fruit to which the Société pomologique de France has consecrated the most numerous and important of its labours.

Poire Madame Ballet.—I place in the foremost rank the name of this variety, destined, if I am not mistaken, to enjoy a great reputation. The name was adopted at the last pomological congress at Pau. Madame Ballet made her first appearance on the 21st February, 1892, at a sitting of the Association Horticole Lyonnaise, being introduced by her raiser, M. Ballet, of Parenty, near Lyons, as the fruit of a tree sown in 1880. In 1894 a committee, nominated for the purpose of judging both the tree and the fruit, awarded a gold medal to the obtainer. In 1895 the Société pomologique de France passed a still more favourable judgment on this pear, and from year to year Madame Ballet continued to grow in favour, until finally adopted by the society quite recently. This new variety acquires daily a more considerable place in local estimation, and has succeeded in supplanting most of the older varieties which hitherto used to supply the winter market.

The following are its chief characteristics: Tree a fine, vigorous, pyramidal shape, robust and very fertile; the scions of one year's growth frequently terminate in a fruit bud, as in the Duchesse d'Angoulême; the eyes, projecting from the wood especially at the upper part of the branch, are black with gray scales; the fruit is of good size, clean, neither wormy nor spotty, perfect in form and colour, gray tawny with yellow stipplings, red-brown on the side exposed to the sun; the flesh is delicate, white, firm, sweet, juicy, and luscious, with an agreeable aroma. Maturity January–February, sometimes as late as March.

If the qualities observed in this pear are everywhere maintained, as there is good reason to suppose they will be, it bids fair to be the best of all trees for gardens and of fruits for the table.

Continuing our enumeration of the pears either obtained or discovered in our region we single out in the first place those which figure in the catalogue of fruits adopted by the Société pomologique. All

are recommendable for their good qualities, and a certain number—both tree and fruit—are as near perfection as one could desire.

Alexandrine Mas.—Obtained by M. Mas, of Bourg, Ain, from seed of Passe Colmar. It is a fruit of fair size, pyriform, and irregular in contour; in colour, citron yellow, slightly bronzed, or (more rarely) washed with russet, on the side exposed to the sun. A very good pear; the flesh white and delicate, sufficiently firm, though luscious and juicy; but to acquire all these qualities it needs a warm exposure and light soil. In espalier against a south wall it does very well. Should be eaten only when completely ripe. February–April. The tree is vigorous near the ground, and, though in this case low in stature, loses none of its abundant and constant fertility. It should be grafted on the Pear.

Blanchet Claude.—Discovered by M. Cl. Blanchet, of Vienne, Isère. The fruit is rather larger in size than Citron des Carmes (St. Jean), ripening at the same time as this, but more aromatic, and preferable to it on that account, and also, for the greater natural fertility of the tree. A tree for standard culture in the orchard.

Favorite Joannon.—Obtained by M. Joannon at St. Cyr au Mont d'Or, Rhône. The fruit is of medium size, turbinate in form; colour uniform yellow, stippled gray. A very good pear, delicate butter-like texture, luscious, very juicy, sweetly acidulate, aromatic; ripening September. The tree is vigorous, hardy, fertile, adaptable to all regular forms, even on the Quince.

Favorite Morel de Lyon-Vaise.—Large-sized fruit of cylindrical form, swelling top and bottom; skin rough, thick, yellow stippled, streaked, and sometimes half-covered with tawny russet. A very good pear, delicate, juicy, vinous flavour, agreeably acidulate and aromatic. October. The tree is as vigorous and as fertile as Louise bonne; very hardy and robust; never hurt by frost even in the coldest winters.

Fondante Fougère.—Obtained by M. Fougère, of St. Priest, Isère. The fruit is medium sized or large, turbinate; pale yellow, smooth skin, stippled red. A very good pear, delicate, luscious, juicy and aromatic. December. The tree is of moderate vigour, more adaptable to small form, and very fertile.

La France.—Raised by M. Claude Blanchet, of Vienne, Isère. The fruit is medium sized, resembling a small Duchesse d'Angoulême, inclining to green, stippled gray, with russet stains at top, bronzed on the sunny side. A very good pear, delicate, juicy, melting, saccharine and aromatic. October–November. The tree is vigorous and fertile, but best for walls owing to its slender ramifications. It is best grafted on Quince.

Madame Bonnefond.—Obtained by M. Bonnefond, of Villefranche, Rhône. The fruit is large and frequently somewhat gourd-shaped, in colour uniformly light yellow, or very slightly green; it is delicious in flavour, very juicy, and sweet; delicately aromatic. December. The tree is vigorous and very fertile, and naturally takes a pyramidal shape convenient for a standard tree.

Madame Chaudy.—Raised by M. Chaudy, of Chaponost, Rhône. It is a magnificent fruit, large, in colour pale yellow, stippled gray, washed tawny, on the sunny side red-gilded. A very delicate flavour, luscious, and agreeably acidulate, aromatic, and refreshing. November. The tree is weak on the Quince; best for small forms; very fertile on the Crab.

Madame Treyve.—Obtained by M. Treyve, of Trévoux, Ain. The fruit is large, regular pyriform; in colour, brilliant green or yellowish when ripe, streaked or stained russet; of exquisite quality; juicy, luscious, rich in sugar, and aromatic. August–September. It is a tree equally fertile as vigorous, and lends itself as easily as a Louise bonne to all forms; does well as a standard tree. It is a first-class fruit for the garden and the orchard.

Marguerite Marillat.—Obtained by M. Marillat, of Villeurbanne. It is a noble pear, large in size, and a pretty golden yellow colour, on the side exposed to the sun a rich vermilion; exquisite in flavour, rich in juice and sugar, acidulated, refreshing, and deliciously perfumed. September–October. The tree is weak on the Quince; is apt, however, for the smaller forms, such as cordons, &c.; is best grafted on the Crab for the larger forms, and, moreover, very fertile on them.

Notaire Lepin.—Obtained by M. Roller, of Villefranche, Rhône. It is a large, even very large-sized fruit; turbinate-truncated in form; skin rough, in colour pale yellow, russet stippled. A good, and sometimes very good, pear when well ripened. March–April. The tree is vigorous and fertile on the Quince, taking excellent shapes; does well in all soils, but, in order that the fruit may exhibit its best qualities, should be planted in a warm soil and a good exposure.

Précoce de Trévoux.—A fair-sized fruit; in colour, deep yellow, stained russet, with bright red streaks on the sunny side. Is characterised by an orange-coloured aureole surrounding the eye at the base of the sepals. A pear of good quality, luscious, and richly scented. July to beginning of August. The tree is very vigorous and of great fertility.

Premices d'Ecully.—Obtained by M. Luizet, of Ecully. Fruit of fair size; in colour, light yellow, slightly tinged with red on the side exposed to the sun. A pear of very good quality, delicate, sweet, juicy, with a pleasant musky aroma. September–October. The tree is vigorous, fruiting plentifully and regularly; remarkably good on walls.

Professor Hortoles.—Obtained by M. F. Morel, of Lyon-Vaise. Fruit of medium or good size; in colour, greenish-yellow streaked with red on the sunny side. A pear of good, or very good, quality, delicate in flavour, luscious, and juicy; pleasantly aromatic, acidulate. September–October. The tree is vigorous and fertile, good for all forms and all stocks.

Souvenir du Congrès.—Obtained by M. F. Morel, of Lyon-Vaise, from seed obtained of a fecundation of choice varieties. A magnificent fruit, one of the largest in size and richest in colour in existence; yellow colour and vermilion on the exposed side. A pear of very good quality, having the flesh and juice of the William less the musky savour, which is replaced by one agreeably acidulated. August–September. This admirable pear will be found figured in nearly all contemporary pomological publications; but the most remarkable are reproductions of fruit that came from California, where the variety assumes its most brilliant colours. The tree is vigorous and “solid,” fertile and hardy in all soils; well adapted for pyramids.

Triomphe de Vienne.—A chance discovery of M. Blanchet in the environs of Vienne, Isère. A superb fruit, long in shape; in colour a fine golden yellow, sometimes russet-tinted and rose on the side of insolation. A fruit of delicious flavour, delicate flesh, melting, full of juice, saccharine, aromatic, and refreshing. August–September. The tree is vigorous, fertile and hardy, easily trained to any form.

Such is the enumeration of Lyonnaise pears, the names of which figure in the catalogue of fruits adopted by the Société pomologique de France. It is a chosen band as to the value and merit of which there is no possible room for doubt. But they are not the sole pears deserving of cultivation; certain varieties, though less favoured by the judgment of Congress, are their rivals, and, under certain conditions and from certain points of view, are even their superiors. This note would therefore be incomplete if it omitted to mention those at least succinctly by enumerating their principal characteristics, as it is proposed to do in our next issue.

FRANÇOIS MOREL.

MAGNOLIA.*

THE genus *Magnolia* was named in honour of Pierre Magnol, Professor of Medicine and Botany at Montpellier in the latter part of the seventeenth and beginning of the eighteenth century, and it falls to the lot of very few botanists to have their name and fame commemorated by so fine a genus. There are at present about thirty species known, of which fifteen are in cultivation in British gardens. The headquarters of the *Magnolias* are China and Japan

THE LARGE-LEAVED MAGNOLIA (*M. MACROPHYLLA*).

(Engraved from a photograph taken at Coombe Wood.)

(including *Corea*), whence nine species have already been introduced, and several more remain to reward the future traveller and plant collector; one of these is a splendid bush or tree with evergreen leaves 2 feet to 2 feet 6 inches in length and about 9 inches broad. This extraordinary species, of which only a solitary specimen was seen by Dr. A. Henry, has not yet been described. Half-a-dozen species occur in the Himalayan region, of which only one, *M. Campbellii*, has found its way into European gardens. One species is found

* With coloured plate from drawing by H. G. Moon at Gravetye, April 1902.

in Malaya, one in Portorico, two in Mexico, and the remaining half dozen hail from the United States.

As pointed out by Professor C. S. Sargent in his "Forest Flora of Japan," arborescent members of the Magnolia family reach, in Japan, the most northern limit attained in any country by these plants. In eastern North America two Magnolias reach nearly as high altitudes as the genus does in Japan, but in the United States Magnolia is really southern, and has only succeeded in maintaining a precarious foothold at the north, while in Yezo it is a most important element and a conspicuous feature of the forest vegetation.

No other genus of hardy or half-hardy trees and shrubs can boast of so many excellences as the Magnolias. The free-flowering qualities and great beauty of some of the Japanese and Chinese species, such as *conspicua*, *obovata*, *stellata*, *parviflora*, etc., are only equalled by the ease with which they can be cultivated. As a single specimen in a conspicuous position on grass, at any rate in the south of England, *M. conspicua* and some of its hybrids and allies are absolutely unrivalled. No lover of gardening who has ever seen the trees of the Yulan at Syon, Gunnersbury Park, or Kew, could ever forget the effect produced by their numberless snowy flowers. *M. grandiflora*, too, is perhaps the finest of all wall plants in our climate, and some of the deciduous kinds of considerably harder constitution are in the first rank of ornamental trees for the adornment of parks and pleasure grounds. Apart from the large and showy flowers of some of these, they would still occupy a high rank for the beauty and distinct character of their foliage. The seeds of Magnolias contain a considerable quantity of oil, and therefore travel badly, retaining—under ordinary conditions—their vitality for but a comparatively limited period; packed tightly in clay or damp earth, however, they retain their germinative power several months.

It cannot be too often repeated that Magnolias are moisture lovers and detest drought; they should, therefore, not be planted where they are wind-swept. A good, rich, deep soil, too, is a desideratum; given the conditions just mentioned, much better results would be obtained than under those with which Magnolias have to be contented as a rule.

For convenience of reference the species mentioned below are divided into two groups, viz.: those which flower before the leaves appear and those in which the blossoms appear after the leaves. For a similar reason the species are, in each group, arranged alphabetically and not in botanical sequence.

FLOWERS APPEARING BEFORE THE LEAVES.

M. Campbellii.—It is very unfortunate that this superb species—one of the most splendid of the flowering trees of temperate climates—has not fulfilled the hopes centred on it when it was introduced to this country some years ago. Being found at elevations of from 8,000 to 10,000 feet along the outer Himalayas, it was expected that the climate of Britain would not prove too severe. Such, however,

has turned out to be the case. There is a fine tree in the gardens of the late Mr. W. Crawford, at Lakelands, co. Cork, which Mr. Gumbleton tells us (*The Garden*, Vol. XXIII., p. 492) was then 35 feet high. The harsh, dry, north-easterly winds of March, however, often prove too much for the numerous flower-buds. Those who have had an opportunity of consulting the picture of this species in Sir Joseph Hooker's "Illustrations of Himalayan Plants" might be excused if they suspect the artist of some exaggeration both in the size of the flowers and in the colour thereof. Mr. Gammie, who knows the tree in its native haunts, certifies that the figure just mentioned is a faithful representation, and he records the flowers as measuring 10 inches in diameter. In a wild state the tree attains a height of 150 feet, and the scented flowers vary in colour—from deep rose to crimson. In 1898, a specimen in the nursery of Messrs. R. Veitch and Son, of Exeter, flowered freely, and the colour of its blossoms was a deep rosy pink, shading off into white at the centre. There is also a fine tree at Fota in the gardens of Mr. Smith Barry, and, judging from a photograph of this taken in 1898, it must have presented an extraordinarily beautiful appearance.—*Hook. fil. and Thomson*, "*Flora Indica*," i., p. 77; *Hooker*, "*Illustrations of Himalayan Plants*," t. 4 and 5; "*Flora of British India*," vol. i., part 1, p. 41; "*Botanical Magazine*," tab. 6793.

The Yulan (*M. conspicua*).—An English garden affords no more beautiful a sight than a fine tree of this Magnolia in full bloom. Perhaps the grandest specimen in the neighbourhood of London is one at Syon, which a score years ago measured 25 feet in height, with a spread of branches of 34 feet. Good specimens also exist at Gunnersbury Park, and in the Royal Gardens, Kew. Unfortunately, however, the late frosts sometimes damage the snowy flowers in many places, even in the south of England. Against a wall—and the tree bears cutting well—frost is not so much to be feared. No one could, however, grumble at having to shelter such a beautiful tree during the flowering season. For conservatory work it is thoroughly fitted, and if grown in tubs or pots in the open air during the summer months and housed during winter a splendid crop of flowers in February or March would be the result. This species has been cultivated by the Chinese and Japanese from time immemorial, but it is not much more than a century since it was first introduced to British gardens, the exact date being 1779. The following interesting note respecting *M. conspicua* was published in *Garden and Forest*. From "Memoires concernant l'Histoire des Sciences des Chinois," written by the early French missionaries at Peking, it appears that the Yulan was cultivated under the dynasty of Tang in 627, and has since

been always a favourite in the gardens of the Imperial palaces and of the temples, and that young plants are used for the decoration of the Imperial apartments in winter. It is the symbol of candour and of beauty; and a powder prepared from the green fruit is used to alleviate bronchial affections.—*Salisbury*, "*Paradisus Londinensis*," t. 38 (1806); *Loudon*, *Arb. et Frut. Brit.*, i., p. 278. *M. Kobus*, *Sieb. and Zucc.*, *Fam. Nat.*, No. 350 (not of *De Candolle*). *M. Yulan*, *Desfontaine's "Histoire des Arbres et des Abrisseaux*," ii., p. 6 (1809); *Bonpland*, "*Description des Plantes Rares Cultivées à Malmaison*," p. 53; *tab. 20*; "*Botanical Magazine*," 39, *tab. 1621*; *Loddiges' "Botanical Cabinet*," 1187; *Koch*, "*Dendrologie*," *erst. Theil*, p. 375.

M. Kobus.—This is a charming deciduous tree with white flowers. It is frequently confounded with *M. obovata*, and also with small-flowered forms of *M. conspicua*. This species in the forests of Hokkaido attains a height of 70 or 80 feet with a trunk nearly 2 feet in diameter, and in the New England States is the hardiest, the most vigorous, and most rapid grower of all the Magnolias, and it gives the same promise in this country. It is apparently as yet uncommon in Britain, but it is certainly deserving of a place in the garden, although in a young state—both here and in the United States—it flowers sparingly. The branches, which when crushed have a distinct odour of camphor, are straight and slender, forming a pyramidal outline; it is only when mature that the tree becomes round-headed. In some localities in its native country it affects swampy ground in the neighbourhood of streams, conditions similar to those which obtain for *M. glauca* in the United States. The flowers are about the size of those of *M. stellata*, but not so pure a white.—*D. C. Syst. Veget.*, i., 456; *Shirasawa*, "*Iconographie des Essences Forestières du Japon*," p. 71, t. 39. *M. tomentosa*, *Thunb. in Trans. Linn. Soc.*, ii., 336 (*exclusis foliis, quæ ad M. hypoleucam*). *M. glauca*, *var. A.*, *Thunb.*, "*Flora Japonica*," 236. *M. Kobus*, *Kämpfer*, "*Icones Selectæ*," t. 42. *M. Thurberi*, *Hort.*

M. Lennei.—This is a strong-growing plant, with large blossoms, the outside of the petals being almost black at the base, and deep crimson towards the tips. Many years ago a specimen in the nursery of Mr. Scott, at Merriott, was described in *The Garden* as being about 15 feet in height and as much through, bearing upwards of a thousand flowers. *M. Lennei* originated as a seedling in Italy, and is supposed to be a natural hybrid between *M. obovata* and *M. conspicua*. *M. Soulangeana nigra*, with the origin and history of which I am unacquainted, is a similar large-flowered, deeply-coloured form I have seen in fine flower in the Coombe Wood Nurseries of Messrs. Veitch.—"*Flore des Serres*,"



MAGNOLIA FLORIBUNDA

(Reproduced from a drawing made at Gravetye, 1902.)

xvi., tab. 1693; *Revue Horticole*, 1866, p. 370; "The Garden," Vol. IX., p. 548, coloured plate.

The Purple-flowered Magnolia (*M. obovata*).—A considerable number of seedling varieties of this wonderfully pretty shrub are in southern gardens, and few plants are more worthy of cultivation. In the northern counties they require, in most localities, the protection of a wall. All the forms I have seen differ from the more generally known *M. conspicua* in their smaller size, in the different form and texture of their leaves, and also in the position, &c., of the petals, the flowers of the last-named species opening more widely than those of *M. obovata*. The colours, too, are different, purple and its shades being the predominant tints in *M. obovata*, whilst white in *M. conspicua*, or white flushed with red or pink, generally obtains in *conspicua* hybrids. The shoots when cut open have a peculiar camphor-like odour.—*Thunb. in Trans. Linn. Soc.*, ii., 336 (excl. icon. *Kämpf.*, t. 43). *M. gracilis*, *Salisbury*, "Paradisus Londinensis," t. 87; *Koch*, "Dendrologie," *erst. Theil*, p. 379. *M. glauca*, var. *B.*, *Thunb.*, "Flora Japonica," 237. *Buergeria obovata*, *Sieb. and Zucc.*, *Fl. Jap. Fam. Nat.*, i., 187. *Talauma Sieboldi et Magnolia obovata*, *Miquel, Prolus.*, 145. *M. purpurea*, *Loudon, Arb. et Frut. Brit.*, i., 35. *M. purpurea*, *Koch*, "Dendrologie," *erst. Theil*, 377 (*in pari*).

Var. discolor is a form with larger flowers than the type.—*Vent. Jardin de Malmaison*, t. 24; *M. purpurea*, "Botanical Magazine," tab. 390.

M. rustica rubra.—The coloured plate of this plant published herewith renders any prolonged description unnecessary. Mr. Wezelenburg, of the Hazerswoude Nurseries, near Leyden, writes as follows respecting it: "We can say nothing for certain about the origin of this Magnolia. About ten years ago we found this variety in the nursery of a friend in Boskoop, when we bought it. This gentleman grew it without a name, and, in conference with him, we named it 'rustica flore rubra.' He told us that he found it amongst seedlings, but did not know the origin of these seedlings. He supposed it a seedling from *M. Lennei*." In any case, it is the handsomest of all the forms which have been derived from *M. conspicua* and *M. obovata*.

M. salicifolia.—As far as foliage is concerned this is a very distinct plant; the rather long-stalked, narrow flowers, tapering to both ends, are as yet unknown to European gardeners. A native of the mountains of Nippon. Professor Sargent found this species on Mount Hakkoda at elevations of from 2,000 to 3,000 feet above sea-level. He describes it as a slender tree 15 to 20 feet in height, with stems 3 to 4 inches in thickness. Like all the rest of Magnolias, it is a moisture-loving species. Professor Sargent succeeded in introducing the tree to the

Arnold Arboretum, and is now here and there in cultivation in this country.—*Maximowicz*, "Mélanges Biologiques," tome viii., p. 509; *Buergeria salicifolia*, *Sieb. and Zucc.*, *Fl. Jap. Fam. Nat.*, 348; *Shirasawa*, "Iconographie des Essences Forestières du Japon," p. 72, t. 40.

M. Soulangeana.—This originated near Paris, and is a hybrid between *M. conspicua* and *M. obovata*. It has the large flowers of the former and the purple-tinted petals of the latter species. There is a tree at Syon 15 feet in height, with a spread of 13 feet. Scarcely different from this are *M. Yulan grandis* (*Rinz in Regel's "Gartenflora,"* v., tab. 166), and also the plants which bear in gardens the names of *M. speciosa*, *M. cyathiformis*, *M. superba*, *M. Alexandrina*, *M. speciosa*, *M. spectabilis*, and *M. triumphans*. In *Garden and Forest*, 1889, 298, a remarkably fine specimen of this hybrid Magnolia is described, probably the finest example in the United States, the stem below the branches measuring nearly 8 feet in circumference: it is in a garden at Hampton, near Baltimore.—*Ann. Soc. Hort. Par.*, i., 99; "Botanical Register," 1164; *Sweet*, "Flower Garden," 260; *Regel*, "Gartenflora," v., 255, tab. 168.

M. stellata.—Few hardy plants introduced of late years to British gardens can vie with this charming shrub in interest or beauty. It was first exhibited in England about 1878 by Messrs. Veitch, who obtained a first class certificate for it. The plant flowers very freely in a young and small state, and makes an excellent subject for cool conservatory decoration; it is, however, perfectly hardy. The beautiful scented blossoms measure about four inches across, and the narrow petals are white with an external stripe of pale pink. Like most other horticultural introductions from Japan, this is cultivated by the natives, and it was observed more than twenty years ago in gardens at Nagasaki by Oldham. According to Franchet and Savatier, it is wild in the woods of Mount Fusi Yama and in Central Nippon, where it forms a small tree. The name *M. Halleana*, given to the species by Mr. S. B. Parsons, of Flushing, U.S., was intended to commemorate the services to the horticultural world of Dr. G. R. Hall, who sent from Japan to the Flushing Nursery a host of interesting and valuable plants. As, however, this beautiful Magnolia had been previously described under the head of *M. stellata*, this latter will have to be kept up.—*Maximowicz in Bulletin Acad. Petersb.*; "Mélanges Biologiques," decas xi., p. 509; "Botanical Magazine," tab. 6370; "Revue Horticole," 1878, 270; *Regel*, "Gartenflora," 1880, p. 407. *M. Halleana*, "Garden," Vol. XIII., p. 572 (coloured plate). *Talauma stellata*, *Miquel, Prolus. Flor. Japon.*, p. 145; *Ann. Mus. Lugd. Bot.*, p. 257. *Buergeria stellata*, *Sieb. and Zucc.*, *Fl. Jap. Fam. Nat.*, p. 78, tab. iia.

FLOWERS APPEARING AFTER THE LEAVES.

The Cucumber Tree (*M. acuminata*).—This forms a large tree 60 to 90 feet in height, with a trunk 2 to 4 feet in diameter. Its English name is owing to the slight resemblance borne by the young fruits to a small cucumber. The leaves, from 5 to 10 inches long, are oblong, pointed, green, and slightly hairy beneath. The slightly fragrant, bell-shaped flowers are a glaucous green colour tinged with yellow. The wood is "soft, close-grained, preferred for pump logs" (Sargent's "Catalogue of the Forest Trees of North America").

In a wild state it is found in rich woods from West New York to Ohio and southward. It is a tall, somewhat slender tree, reaching its largest size and abundance in the narrow valleys about the base of the high mountains of Carolina and Tennessee. From "Hortus Collinsonianus" we learn that the Cucumber Tree was introduced to this country by Collinson. His memoranda respecting it are as follows: "My two deciduous or mountain Magnolias were planted from seed in 1746; planted one in the corner of the bed in the best garden. May 20, 1762, the mountain Magnolia flowered in my garden, which I raised from seed about twenty years ago, being the largest and highest tree in England, and is yet in very few gardens." At the present time there are handsome trees of this species at Kew, the finest being 45 feet in height, spread of branches 46 feet, circumference of stem at one foot from the ground 5 feet. To Mr. Woodbridge I am indebted for the dimensions of the largest specimen now at Syon, viz., height, 34 feet; girth of trunk, 5 feet 6 inches; spread of branches, 33 feet. Mr. F. W. Burbidge has kindly furnished me with the measurements of the finest tree in the Trinity College Botanic Gardens at Dublin: height about 55 feet, circumference of trunk 30 inches. Mr. F. W. Moore writes me from the Royal Botanic Gardens, Glasnevin, respecting a fine tree near Ardee, in co. Louth; this is 30 feet high, and has a very fine head. Finally, Mr. E. Burrell sends me particulars of a grand tree at Claremont: height, 40 feet; circumference of stem at 18 inches from the ground, 5 feet 6 inches. The measurements of the different trees just mentioned were taken in 1883.—*Sp. Plant.*, 2 ed., 756; Michaux, "*Flora Boreali-Americana*," 1, 328; "*Nouveau Duhamel*," 2, 222; Michx. fil., "*Arbres Forestiers de l'Amérique Septentrionale*," 3, 82, tab. 3; Loddiges' "*Botanical Cabinet*," 418; "*Botanical Magazine*," tab. 2427; Loudon, *Arb. et Frut. Brit.*, 1, 273, tab. 7 and 8; Gray, "*Manual of the Botany of the Northern United States*," 49; Koch, "*Dendrologie*," *erst. Theil*, p. 371; Sargent, "*Silva of North America*," *tt.* 4, 5.

Var. aurea is a valuable ornamental tree with golden foliage, slightly streaked and mottled with green. It originated in an American nursery, but I am ignorant of its exact history.

The Yellow Cucumber Tree (*M. cordata*).—According to Loudon, this was introduced into England in 1800. It was discovered by the elder Michaux in forests along the banks of rivers in Georgia. It is quite hardy in the south of England at any rate, and good specimens are to be seen in the arboretum at Kew. The leaves are broadly ovate, more or less heart-shaped at the base, the upper surface being smooth, and the lower tomentose. The very faintly odorous yellow flowers, the interior petals being frequently marked with reddish lines, are from 3 to 4 inches across. The yellow Cucumber Tree forms a small or medium-sized tree. It differs from the last-named species in its smaller bright canary-yellow flowers, in its broader, darker green, more persistent leaves, sometimes heart-shaped at the base. The exact counterpart of our cultivated plant has, it appears, not been rediscovered in a wild state.—Michx., "*Flora Boreali-Americana*," 1, 328; Michx. fil., "*Arbres Forestiers de l'Amérique Septentrionale*," 3, 87, tab. 4; "*Botanical Register*," 4, tab. 325; Loddiges' "*Botanical Cabinet*," tab. 474; Reichenbach, "*Flora Exotica*," t. 250; Loudon, *Arb. et Frut. Brit.*, 1, 275, t. 9; Koch, "*Dendrologie*," *erst. Theil*, p. 371. *M. striata*, Hort. *M. acuminata*, var. *cordata*, Sargent, "*Silva of North America*," t. 6.

M. Delavayi.—This is a new species which at present only exists in cultivation in the Coombe Wood Nurseries of Messrs. Veitch. It is an evergreen tree with rather long-stalked leathery leaves, which are silvery beneath. The egg-shaped flowers are white and fragrant, the petals being thick, and in form oblong-spathulate. As a species it comes somewhat near the Himalayan *M. Griffithii* and *M. spenocarpa*, neither of which has yet found its way to European gardens. *M. Delavayi* is a native of Yunnan, where it was collected by Dr. Henry on rocky mountains, at elevations of from 5,500 to 7,000 feet.—Franchet in "*Plantæ Delavayanæ*," p. 33, tab. 9, 10.

The Ear-leaved Umbrella Tree (*M. Fraseri*).—This species attains a height of from 30 to 50 feet. The light green glabrous leaves, which are oblong-obovate or spathulate in form and auricled at the base, are from 8 to 12 inches in length by about half that breadth; as in the Umbrella tree, they are mostly crowded together at the tips of the flowering branches in an umbrella-like circle. The flowers are milky-white, and measure 3 or 4 inches in diameter; according to Loudon, they are

agreeably scented, whilst Gordon states that they exhale a disagreeable odour. This is fairly abundant in the forests in certain districts of the Southern Alleghanies, and I have myself noted it near Roan Mountain. It forms a slender tree 30 to 40 feet in height with a straight or inclined trunk 12 to 18 inches in diameter.—Walter, "*Flora Caroliniana*," p. 159 (tab.); Gray, "*Manual of the Botany of the Northern United States*," p. 49; Koch, "*Dendrologie*," *erst. Theil*, p. 372. *M. auriculata*, Lam. Dict., 3, 673; Michx., "*Flora Boreali-Americana*," 1, 328; "*Nouveau Duhamel*," 2, 222; Andrews, "*Botanical Repository*," 9, tab. 573; "*Botanical Magazine*," tab. 1206; Loudon, *Arb. et Frut. Brit.*, 1, 276, t. 10. *M. auricularis*, Salisbury, "*Paradisus Londinensis*," tab. 43; Sargent, "*Silva of North America*," tt. 11, 12.

The Laurel Magnolia or Sweet Bay (*M. glauca*).—The former of the two English names above quoted seems the best suited for English readers, as with us the latter, under which this charming species is known in the United States, is applied to a totally different plant, viz., *Laurus nobilis*. White Bay is another of its American names, but Laurel Magnolia, one of the names adopted by Dr. Asa Gray in his "Manual," seems distinctive and definite enough to answer all purposes. *M. glauca* is certainly a very handsome shrub, with oblong or somewhat oval leathery leaves, light bluish-green above and silvery below, and delightfully fragrant globular flowers, which open a rich cream colour and gradually acquire a pale apricot hue. In damp, sheltered places the plant is sub-evergreen, but in drier and more exposed spots deciduous. The bark of the young shoots is a rich apple-green, that of the older branches glaucous or whitish. In its native localities it sometimes attains a height of from 50 to 70 feet, with a trunk 2 or 3 feet, or under exceptionally favourable conditions 3½ feet, in diameter; in the north it is reduced to a low shrub. In August, in its native localities, the red fruit cones contrasting with the shining glossy leaves produce a fine effect—it is then even showier than when in flower. It is found in swamps throughout Essex County, Massachusetts, and from Queen's County, Long Island, to Louisiana and Southern Arkansas, generally near the coast. The roots yield a yellow dye. According to Emerson, the plant affords a good tonic and warm stimulant and diaphoretic, and has been used with great success in chronic rheumatism, in intermittent fevers, and particularly in fever and ague.—Linn., "*Species Plantarum*," 2 ed., 755; Lam. Dict., 674; Michaux, "*Flora Boreali-Americana*," 1, 237; "*Nouveau Duhamel*," 2, 233, tab. 66; Bon. pl. Pl. Malm., 103, tab. 42; Michx. fil., "*Arbres Forestiers de l'Amérique Septentrionale*," 3, 77, tab. 2; Loddiges' "*Botanical Cabinet*," 215; Loudon *Arb. et Frut. Brit.*, 1, 267, tt. 3 and 4; Gray, "*Manual of the*

Botany of the Northern United States," 49; Koch, "*Dendrologie*," *erst. Theil*, 369; Emerson, "*Trees and Shrubs of Massachusetts*" (ed. 1875), 603; Sargent, "*Silva of North America*," t. 3.

Var. pumila is a dwarf variety, not exceeding 3 or 4 feet in height; found in East Florida.—Nuttall in "*American Journal of Science*," v., 295.

The great Laurel Magnolia (*M. grandiflora*).—Unfortunately, this stately tree is not able to withstand severe winters, by which the patience of many cultivators of out-door plants is so sorely tried. Even in the south of England it is safer to treat the great Laurel Magnolia as a wall plant. There are few more noble and imposing subjects when allowed sufficient space, and the front of a goodly house clothed with the glossy deep green leaves and the large, handsome, scented white flowers of this species is not a sight to be easily forgotten. In the Bull Bay, as it is sometimes called, the temperate countries of the world have the most beautiful evergreen tree known in gardens. It has been suggested as a "national flower" for the United States, and its claims to such an honour urged by more than one writer. Mr. Burrell gave me, in 1883, the measurements of the finest specimen at Claremont, viz., 24 feet in height, with a stem 3 feet 2 inches in circumference at 1½ feet from the ground. *M. grandiflora* is a native of the Southern United States, and was introduced to this country about 1737. An extract is given in "*Hortus Collinsonianus*," from a letter written from Georgia, by John Bartram to Collinson: "The great Laurel-leaved Magnolia grows 100 feet high, and 3 or 4 feet in diameter." Collinson adds, "What a noble sight!" In *The Garden*, Vol. II., p. 205, there is an interesting article, as well as an illustration, of "*Magnolia grandiflora at Home*."—Linn., *Sp. Plant.*, 2 ed., 755; Bartram, "*Travels*," 85; Michaux, "*Flora Boreali-Americana*," 1, 327; "*Nouveau Duhamel*," 2, 219, tab. 65; Andrews, "*Botanical Repository*," 8, tab. 518; Michaux fil., "*Arbres Forestiers de l'Amérique Septentrionale*," 3, 71, tab. 1; Loudon, *Arb. et Frut. Brit.*, 1, 261, tab. 1, 2; Koch, "*Dendrologie*," *erst. Theil*, p. 367. *M. fastida*, Sargent, "*Silva of North America*," tt. 1, 2.

Var. angustifolia.—The foliage of this is very distinct, being lanceolate, tapering to both ends, with wavy edges. It was introduced to this country from the Continent nearly sixty years ago, but I have seen no large specimens.—*Var. salicifolia*, Hort.; *var. Hartwegi*, Hort.

Var. ferruginea.—This differs from the preceding in having rather broader leaves and larger flowers, and in forming a broader and more compact tree or bush; by some authorities, too, it is stated to be a good deal hardier, having withstood winters which have proved fatal to *var. lanceolata*.

Var. lanceolata.—The leaves are oblong-elliptical, generally rusty beneath. It forms a tall bush or small tree of fastigiate habit, and flowers early and freely; the best variety for general cultivation.—*Ait., Hort. Kew.*; “*Botanical Magazine*,” *tab.* 1952; *var. exoniensis*, *Loddiges’ “Botanical Cabinet,” tab.* 814; *var. stricta*, *Hort.*

Var. obovata differs from the type in the leaves being of an obovate-oblong form, their broad ends contrasting markedly with the more or less pointed outline of those of the typical form.

A host of seedling forms have received varietal names in nurseries, but as it is impossible to distinguish many of them from each other, they are just given here without comment. I have seen a number of them, but neither in habit nor in leaf characters do they call for special remark—*macrantha*, *crispa*, *Gallisonieri*, *majardieriensis*, *nannetensis*, *rotundifolia*, *præcox*, *latifolia*, *rubiginosa*, etc.

M. hypoleuca.—Like several other valuable ornamental trees, this was first introduced into the United States from Japan, and afterwards found its way to this country. It is as yet somewhat rare. In *The Garden*, Vol. XVI., p. 373, *hypoleuca* is spoken of in high terms of praise; its merit “lies chiefly in the great beauty of its milk-white flowers, which resemble those of *conspicua*, and possess a delicious banana-like odour, surpassing that of any other hardy Magnolia. Bright and attractive in foliage, the underside of the leaf is greenish white, hence the name.” The leaves are indeed striking enough; they measure from 12 to 18 inches in length by about half the width in the broadest part, which is above the middle. The timber of this tree is no doubt valuable in Japan, and in a report by His Majesty’s Acting Consul at Hakodati on the lacquer industry of Japan, published last year, it is asserted that “all sword sheaths have hitherto been made of this wood.” Charcoal made from it, too, is used in the polishing and preparation of the high-class lacquered articles for which the Japanese are so famous. Japanese specimens of sword and dagger sheaths, &c., made of the wood of this Magnolia are to be seen in the museum (No. 1) at Kew. Of the New World species, this comes nearest in general resemblance to *M. tripetata*. In his “Forest Flora of Japan,” Professor Sargent tells us that *M. hypoleuca* is seen at its best in damp, rich forests, which cover the rolling hills of Yezo; it sometimes attains a height of 100 feet, with a trunk 2 feet in diameter. On the other Japanese islands it is confined to mountain forests, and apparently does not descend below 2,000 feet above sea level. In Central Japan it is seen rarely more than 20 or 30 feet in height, perhaps because the larger trees have been cut for timber. It requires a cold winter climate for its best development. It

is, too, one of the largest and most beautiful of deciduous Magnolias. In early autumn, when the cones of fruit, which exceed those of any of the American species in size (sometimes 8 inches in length), brilliant scarlet in colour, stand out on the branches, it is the most striking feature of the forests of Hokkaido, which in variety and interest are not surpassed by those of any other part of the world. The very fragrant flowers measure 6 or 7 inches when fully expanded, have creamy-white petals, and brilliant scarlet filaments.—*Sieb. and Zucc. Fam. Nat.*, n. 349; *Shirasawa*, “*Iconographie des Essences Forestières du Japon*,” p. 70, t. 39. *M. glauca*, *Thunb.*, “*Flora Japonica*,” 273, not of *Linneus*.

The Great-leaved Magnolia (*M. macrophylla*).—For size and beauty of foliage the Great-leaved Magnolia undoubtedly occupies the first place amongst all the trees and shrubs with undivided leaves which are hardy in British gardens. Its leaves attain a length of from 2½ to 3½ feet; in shape they are obovate-oblong, cordate at the narrowed base, and hairy and white beneath. The open bell-shaped fragrant flowers are white, with a purple blotch at the base of the inner petals, and measure 8 or 10 inches across. It is rare even in a wild state. Its native distribution is as follows: Iredell and Lincoln counties, North Carolina to Middle Florida, and west of the Alleghany Mountains, from South-eastern Kentucky, southward through Tennessee to Central Alabama. A tree 20 to 40 feet in height, with trunk rarely exceeding 1 foot in diameter. The following dimensions of a tree at Claremont were kindly furnished me in 1883 by Mr. E. Burrell: Height, 30 feet; circumference of stem at 18 inches from the ground, 2 feet 9 inches; and a spread of branches of 28 yards.

M. macrophylla was discovered in 1789 in North Carolina by the elder Michaux, and in 1800 it was introduced into European gardens. The flowers and leaves are the largest of those of any species in the genus, and are larger and more conspicuous than those of any tree in the North American forests. Protection from wind is essential to this tree, as the leaves otherwise get torn and injured. In a wild state it attains its maximum development in sheltered limestone valleys of North Carolina, where it is always found in sheltered forest glades or small valleys, surrounded and often overshadowed by Hickories, Sweet Gum (Liquidambar), etc.—*Michx.*, “*Flora Boreali-Americana*,” 1, 327; *Michx. fil.*, “*Arbres Forestiers de l’Amérique Septentrionale*,” iii., 99, *tab.* 7; *Bonpland*, “*Jardin de la Malmaison*,” 84, t. 33; *Nuttall*, “*Sylva*,” 1, 83; “*Botanical Magazine*,” *tab.* 2189; *Loudon*, *Arb. et Frut. Brit.*, 1, 271, t. 6; *Gray*, “*Manual of the Botany of the Northern United States*,” 49; *Koch*, “*Denarologie*,” *erst. Theil*, 374;

Sargent, "*Silva of North America*," tt. 7, 8. *M. Michauxi*, Hort.

M. parviflora.—This is one of the most handsome of hardy ornamental shrubs, and will doubtless become widely cultivated and duly appreciated by all lovers of gardening. It has, of late years, been largely imported into this country, and flowers and also ripens fruit freely. It differs from the other species known in gardens by its long flower stalks. In the Bamboo Garden at Kew a large bush is annually covered with the handsome blossoms. *M. parviflora* is said to be a native of the Alps of Nippon. The nearest relation to the species now under consideration is the United States *M. glauca*.—Sieb. and Zucc., *Fam. Nat.*, 351; Miquel, "*Prolusio*," 146; Maximowicz, "*Mélanges Biologiques*," tome viii., p. 509; "*Botanical Magazine*," t. 7411.

M. pumila.—This is a Chinese species, which was introduced to this country nearly a century ago. It has elliptic, wavy, rather leathery, glaucous leaves and very fragrant, nodding, egg-shaped white flowers. Formerly this was treated as a stove plant, but it only requires shelter from frost, and will grow well and flower freely in a cool conservatory.—Andrews, "*Botanical Repository*," 226; "*Venteauat Jardin de la Malmaison*," p. 37, tab. 37; "*Botanical Magazine*," tab. 977. *Talauma pumila*, Lindley in *Penny Encyclop.*, with figure.

M. pyramidata.—This species has been confused by recent botanists with *M. Fraseri*, from which it differs abundantly in habit, size of flowers, &c. It is a tree of more upright pyramidal growth, with much smaller leaves than those of *M. Fraseri*, and thinner in texture, green on both surfaces, and with divaricate lobes. In *M. Fraseri*, on the other hand, the leaves are green above, glaucous beneath, with converging lobes. The flowers, too, in this last-named species are much larger, and the anthers, too, are different. The geographical distribution of the two is entirely different—true *M. Fraseri* is an inland mountain plant, whilst *M. pyramidata* affects the lowlands along the coast. I have seen the last-named species many years ago in the Trianon garden at Versailles, and dried flowering specimens exist grown in the famous Bollwyller nursery in Alsace more than half a century ago. Bartram, in his "*Travels through North and South Carolina, Georgia, East and West Florida*," gives the following account of *M. pyramidata*: "I discovered in the maritime parts of Georgia, particularly on the banks of the Alatamaha, another new species of Magnolia, whose leaves were nearly of the figure of this tree (*M. Fraseri*), but they were much less in size, not more than 6 or 7 inches in length, and the strobile very small, oblong, sharp-pointed, and of a deep crimson colour; but I never saw the flower. These trees grow straight and erect, 30

feet or more in height, and of a sharp conical form, much resembling the Cucumber Tree in figure."—Pursh, "*Flora Americae Septentrionalis*," vol. ii., p. 382; Bartram, "*Travels*," p. 340; "*Botanical Register*," t. 407; Loddiges' "*Botanical Cabinet*," t. 1092; Loudon, *Arb. et Frut. Brit.*, i., 227, f. 11.

M. Thompsoniana.—This is a remarkable form of vigorous habit, with leaves and flowers two or three times the size of the type. It originated as a seedling in the Mile End Nursery of Mr. Thompson. Loudon thinks that the *M. glauca*, var. *longifolia* (Aiton, "*Hortus Kewensis*," 1 ed., ii., 251), is a wild form identical with the plant of garden origin here mentioned.

Other varieties, the names of which are met with in books, but very rarely in gardens, are *arborea*, *sempervirens*, *latifolia*, *Gordoniana*, and *Burchelliana*. The last two were described by Sabine in the "*Transactions of the Horticultural Society*" as Gordon's Double Swamp Magnolia and Burchell's Double Swamp Magnolia respectively, these names being altered by Koch in his "*Dendrologie*" to *M. Gordoniana* and *M. Buchananiana*. The var. *pumila* of Lavallée's "*Arboretum Segrezianum*" does not belong here at all, but is a true species from a different country, viz., China. *M. Thompsoniana* is now regarded by Professor Sargent and other authorities as a hybrid between *M. glauca* and *M. tripetala*. See *Garden and Forest*, 1888, 269, fig. 43.—"*Botanical Magazine*," tab. 2164; Reichenbach, "*Flora Exotica*," 342.

The Umbrella Tree (*M. tripetala*).—The leaves of this species are obovate-lanceolate, pointed at both ends, soon becoming glabrous; they measure from 1 foot to 3 feet in length, and the slightly-scented white flowers are from 5 to 8 inches across. In a wild state the Umbrella Tree rarely exceeds 40 feet in height, with a straight or often inclining trunk rarely more than 18 inches in diameter, generally much smaller, and occurs in York and Lancaster counties, Pennsylvania, to Virginia and Kentucky along the Alleghanies. To Philip Miller is due the credit of introducing this fine tree to English gardens. A year or two later it was independently introduced by Collinson, the following memorandum written by him being quoted from "*Hortus Collinsonianus*":—"In the year 1753 I had sent me from South Carolina a species of Magnolia, called the Umbrella. I had it planted in Mr. J. Gordon's garden for him to increase it; it flourished finely and flowered; May 24, 1760, opened its two first blossoms, and has 24 more to flower; this is the first tree that has flowered in England."—Linn. *Sp.*, *Plant.*, 2 ed., 756; Michaux, "*Flora Boreali-Americana*," 1, 327; Michx. fil., "*Arbres Forestiers de l'Amérique Septentrionale*," 3, 90, tab. 15; Loudon, *Arb. et Frut. Brit.*, 1, 269, tab. 5; Koch, "*Dendrologie*,"

erst. Theil, 370; Sargent, "Silva of North America," tt. 9, 10. *M. Umbrella*, Lam. Dict., 3, 673; "Nouveau Duhamel," 2, 221; Gray, "Manual of the Botany of the Northern United States," 49.

M. Watsoni.—At first sight this somewhat resembles *M. parviflora*, but it differs from that species in the yellow margin to the leaves—more numerous nerves, which are ten to fifteen in number (as against six or eight in *parviflora*). The flowers, too, are shortly stalked, larger, 5 to 6 inches in diameter, and have a powerful odour of Allspice (*Calycanthus*). The petals are white and open out more fully than do those of the last-named

species; the filaments are blood-red in colour and the anthers themselves a dull reddish yellow. The exact home of *M. Watsoni* is uncertain: Professor Sargent thinks it is not Japanese, but may be Korean. Unfortunately, so far, the exact requirements of this beautiful Magnolia are not understood; at any rate it does not thrive in this country, as far as my experience extends, so well as *M. parviflora*.—Hook. fil., "Botanical Magazine," t. 7157.

M. compressa (Maxim) and *M. fuscata* (Andrews) are now regarded as belonging to the genus *Michelia*, and are therefore not further mentioned in these notes.

GEORGE NICHOLSON.

A REVISION OF THE GENUS CALOCHORTUS.

UNDER the above title I wrote a monograph which was published in 1901 by the Californian Academy of Sciences. It was a work intended for botanists, and it was my endeavour to make it as complete as possible, and naturally it contained much matter not of interest to those who are lovers and growers of these lovely flowers rather than interested in them from the standpoint of the field botanist. My kind friend the editor has asked me to prepare a version of the work for FLORA for garden use, and it is with pleasure that I endeavour to comply with his request. The last few years have added somewhat to my knowledge of the plants, and if any of my readers should note discrepancies between the present and any former writings of mine upon the subject they will understand that they are intentional, and that the present paper is correct, to the best of my knowledge of the subject. While I shall in this paper give some information in regard to the soils and conditions under which I have observed some of the species to thrive, and, perhaps, some personal experience of their culture, I am not attempting to go far into the matter of culture.

Mr. George B. Mallet, in *The Garden*, has during the past year written an excellent article upon the genus, and I feel sure that so good a grower, living upon the spot, will have better learned what the plants require in the British climate. The treatment he recommends for England varies but little from that which my experience here tells me is the best.

It is now some twenty-three years since I first became interested in Calochorti, and in that period I have had the privilege of seeing many species in their native homes, and of flowering nearly all of them in my garden. The territory they inhabit is truly an immense one. On the north they extend into British Columbia, on the south into Northern Mexico, on the east they cross the Rocky Mountains, while on the west they go to the very brink of the Pacific Ocean. Some of the species are very widely scattered, as, for instance, *C. Nuttalli*, which extends the entire width of the great basin and across the

Rocky Mountains to Nebraska ; and *C. albus*, which is found for a distance of fully 600 miles in California.

Those vast regions are as various in soils, climates, and altitudes as any of equal area in the world, yet some kind of *Calochortus* lives in every portion of it. *C. Nuttalli* grows in all but desert places, and endures a winter temperature as low as 40 degrees below zero, where in the summer the heat is great. *C. elegans*, *C. Lobbi*, and *C. Leichtlini* climb the mountains to an altitude of fully 9,000 feet with often less than three months between two snows ; *C. lilacinus* delights in wet meadows, where for four or five months of the rainy season it is under water most of the time. *C. Purdyi*, *C. Tolmiei*, *C. Howellii*, and *C. Maweanus roseus* grow in such soils as wheat thrives in, in the Willamette Valley, in Oregon, where summer rains are rather more frequent than in England ; and *C. Kennedyi* is at home in the desert in a packed gravel, and where for many seasons the rainfall is so slight as to preclude its flowering. *C. Vesta* grows only in heavy clays, *C. aureus* in marl, *C. venustus robustus* in the heavy packed soils around wet swales, and *C. striatus* in saline meadows.

It is a peculiarity of *Calochorti*, as well as many other Pacific Coast liliaceous plants, that in a given section of country there is, as a rule, little variation from a well-marked type. A short distance away there is a type slightly but constantly different, and by slight steps the variation increases, until at points remote from each other differences are to be noted which might well merit the distinction of being called species, did not intervening localities offer such a perfect chain of intermediate forms as to make segregation impracticable.

I have no doubt that these local sub-species are adaptations to the conditions, and the genus as a whole is one of the finest examples to be found in nature of an evolution accomplished and rapidly going on.

These local sub-species may be found over an area of a few miles square, or they may extend for hundreds of miles where the same climate and soil continue for long distances. East of the Sierra Nevada mountains and the Cascades, their northern continuation, we find that *C. Nuttalli*, *C. macrocarpus*, and *C. nitidus* are found for hundreds of miles without any material variation ; west of the Sierras, in California, we have in the foothills, at about a uniform elevation, in the same soil and accompanying the same shrubs and trees, *C. albus*, scarcely varying at all for 300 miles, while in the coast range, with its endless climates and soils, changes come frequently in the local types.

Hybrids are not uncommon. I have seen hybrids between *C. albus* and *C. Benthami*, *C. pulchellus*, and *C. Maweanus*, and between the strains of *C. luteus*, but I have still to see a fertile hybrid between the first two crosses mentioned. While I have observed such hybrids as I have spoken of, I have, after diligent search, failed to find the least evidence that some strains, which to a

botanist seem very nearly related, ever hybridize; for instance, I have seen tens of thousands of *C. luteus*, var. *citrinus*, and *C. venustus*, of the El Dorado strain, intermingling in full bloom, and I have found masses of *C. Vesta* in flower at the same time as *C. venustus*, var. *citrinus*, without finding a single plant that in any way showed hybridization.

The size of the plants of any species varies greatly according to conditions. In the woodland species the variation in size is the greatest, and the largest factor in this variation is the forest and brush fires, which are periodic in all the woodlands of the West.

Plants of *C. albus*, *C. Maweanus*, or *C. elegans*, which in the packed soils and shade of the dense growth were slender plants a few inches high and with few flowers, will, in the first year or two succeeding a fire, grow stems 8 inches to 2 feet high, with broad leaves a foot or two long, and a dozen or more fine flowers. Doubtless the plentiful supply of potash, the loosening action of fire, and the subduing of other growth, all have a part in causing this transformation. The woodland species also vary greatly as to situation. I have observed that all of this class of *Calochortus* make their finest growth when they grow on rocky ledges in the rich mould which gathers in such spots. Often such a ledge will be the seat of a colony of the finest specimens.

The plants of the Mariposa sections are more dependent upon the rainfall than the others, for in the woodlands a slight rainfall may be enough. In a dry season the Mariposas may in a given spot be scattered and small, but let there come a season of abundant rainfall, continuing into the spring months, and the same spots will be glorious gardens of magnificently developed plants.

In the descriptions which I give I describe the prevalent form of each, and leave out all non-essential characters.

The *Calochorti* belong to the Lily family, and have a small ovate bulb, grassy leaves, a branching stem, many flowers the outer divisions of which (sepals) are narrow and greenish, and the inner (petals) broad and coloured. The seed-pod is three-cornered. The inner divisions of the flower have a small pit or gland at their base.

SECTION I.

In this section the plants have a single long shining base leaf: both the flowers and seed-pods are more or less nodding, and the stems are slender and flexuous, and, if branching much, spread laterally. The seed-pod is conspicuously three-cornered, and oblong or elliptical in shape. Nearly all are woodland plants.

GROUP I., GLOBE TULIPS.—These all have globular, pendulous flowers, and are woodland plants. *C. albus* is found in two forms; the one best known by the name grows in the Sierra Nevada foothills.

In it the flowers are long-globular, and after a day or so the petals open out enough to show the inside of the flower; they are pure white with a purplish base, and are lined with long silky hairs. They are stout and tall. The second variety is found in the coast range of California from San Mateo County south. It is of a lower, more compact habit, with more perfectly globular flowers. The petals are of more substance, and of a pearly white tinted heavily with brown or pink. The flowers never open. The flowers of this form are handsomer, but the plants not so strong. It has never been given a botanical name, but has been catalogued as "The Pearl."

C. amœnus.—In the southern portion of the Sierra Nevada *C. albus* is replaced by a delicate rose-pink form. It is essentially the same in character as the Sierran *C. albus*.

C. pulchellus.—The true *C. pulchellus* was one of the first discovered, as it was collected by Douglas, sent to England, and described and figured in 1835.



1 CALCCHORTUS CLAVATUS. 2 C. HITIDUS.

Later it was lost sight of, and its very name appropriated by *C. amabilis*. It has been reintroduced during the last few years as *C. pulchellus* (Douglas). From Mount Diablo, California. This most lovely species can best be described as a light yellow form of *C. albus*, "The Pearl." The flowers are the largest of any of the globe tulips, and finely globular. The petals are exquisitely fringed with short stiff hairs.

C. amabilis.—Was until this year known as *C. pulchellus*. It differs in having much smaller flowers, of quite another shape and a much deeper yellow. The petals are very strongly arched, and the flower is very suggestive of the paper pin-wheels with which children play. The very deep gland projects like a knob on the back of the petal. Usually a plant 6 or 7 inches high, I often see it a foot or more high, with as many as sixteen flowers. Give it a sheltered position on a rock garden with a soil very rich in leaf mould, and it will make a grand plant. The largest specimen that I ever saw was growing in the decayed mould of a rotten tree. It is a native of the coast ranges north of San Francisco Bay for 200 miles, a region of very heavy rain-falls.

GROUP II., SMALL STAR TULIPS.—This group has the general character of the preceding, but differs in being very slender and flexuous, with the cup-shaped flowers erect or nearly so, and the seed-pod pendulous. They very seldom bear offsets on the stem, and are natives of shady woods.

C. Maweanus.—The type is a very slender plant with whitish flowers densely covered with silky bluish hairs, and nothing could be more dainty. The type grows in the coast ranges of California north of San Francisco bay in the same region as *C. amabilis*, but choosing the colder, shadier spots in the higher mountains. Var. *major*.—In the Sierra Nevada foothills, in north-eastern California, this strong form is found. It is fully twice as large and in every way sturdier, and likes more sun. The var. *roseus* occurs in Oregon, in a belt of country which has a very heavy rainfall, with much summer and autumn rain—indeed, a climate very much like that of England. *C. Maweanus* is represented by two forms also. The minor form has a bulb coated with a deep brown skin, and the flowers are strongly tinged rose. It is a fine form. The other, more local in distribution, is like it, but almost rivals *C. Purdyi* in robustness.

C. cæruleus.—The true *cæruleus* is the daintiest of the Star Tulips. It resembles *C. Maweanus* but has much longer silky hairs, and the pod is shorter and broader. The higher regions of the Northern Sierra Nevada are its home, where it grows in the pine forests.

C. Benthami.—This species is a native of the foothill belt of the central Sierra Nevada moun-

tains, and can be summed up as a yellow *C. Maweanus*. It endures more heat and is hardier than the others.

C. elegans.—Known in two forms. The type grows in the far North-West, in Idaho, in the pine woods. It is a very slender species, the white flowers covered with short silky hairs. Var. *nanus*.—This is quite a different plant, with light yellow flowers covered with long silky hairs. It comes from the high peaks of the Cascades in Oregon, and is one of the prettiest of the Star Tulips. It has been distributed as *C. apiculatus*.

C. Lobbi.—Another of the dainty *elegans* group. The flowers are white, tinged green, and densely covered with silky hairs. The very deep gland projects without in a knob. A pretty and distinct species from Mount Jefferson, a high peak of the Oregon Cascades. *C. nudus*.—This can be summed up as a perfectly hairless species, otherwise like the smallest forms of *C. elegans*. In the high Sierras of California on densely shaded slopes. *C. umbellatus* is also known as *C. collinus*. It is a full-flowered stronger-growing species, which can at all times be easily identified by its broad white petals, which have only a few hairs above the gland, and by the absence of offsets on the stem. It is a good species, which grows only on the low hills about San Francisco Bay, and often in open grassy spots. I have always found it in heavy clays, and any *Calochortus* which grows naturally in heavy clays is more apt to prove easy to cultivate.

C. uniflorus.—Better known as *C. lilacinus*. It can always be recognised by the many offsets which form on its stem below the surface of the ground. The flowers are large, with lilac to purplish petals, which have only a few hairs above the gland. *C. lilacinus* grows only in meadows which are very wet during the rainy season and dry up after flowering time. It extends from Monterey Bay to Central Oregon, and is probably the hardiest and most vigorous of all *Calochortus*.

C. Shastensis.—A most dainty little species, which is found in wet meadows at about 5,000 feet on Mount Shasta, California. It is very slender with whitish flowers, which are entirely destitute of hairs. The seed-pod, unlike that of any other Star Tulip, is erect when ripe.

GROUP III., GIANT STAR TULIPS.—Sturdy erect plants, which grow in open fields and meadows throughout Western Oregon (except *apiculatus*). As I have said, Western Oregon is a region where the winters are quite cold and the rainfall heavy, both in summer and winter. They are found in all soils, and are at their best in the grain-fields.

C. Tolmiei.—From 9 to 18 inches high, stout, white or blue flowered, the petals densely covered with bluish hairs. *C. Purdyi* only differs in the

gland, and the flowers being creamy white or tinged purple, with silky white hairs on the upper half and similar purplish ones on the lower half. The only sure distinction between this and the former is that *C. Tolmiei* lacks a scale above the gland that *C. Purdyi* possesses. There is a difference in colour, but the scale is the final test. *C. Tolmiei* varies much in colour. The light-coloured forms are hardly to be distinguished from *C. Purdyi*, except by the scale test, but the darker ones give a shade well worth growing the plant for.

C. apiculatus.—In this fine species the petals are straw-coloured, with only scattering hairs above the gland. It is a native of Northern Idaho, and has never been in cultivation.

SECTION II.

Mariposa Tulips.—In all of the Mariposa section of *Calochortus* the flowers and seed-pods are stiffly erect. The Oregon Mariposas connect the giant Star Tulips very closely with the true Mariposas.

GROUP I., OREGON MARIPOSAS.—These have a long shining base leaf like the preceding species, and a very similar capsule, which is always stiffly erect.

C. nitidus.—After the splendid plate in FLORA, description of the flower of this species would seem superfluous. The stems are stout, with an offset at the base, the flowers in umbels. There are variations in colour, from lilac to white; but the vivid purple blotch in the centre of each petal is a constant feature. It is found in the region east of the Oregon Cascades, and as far north-east as the Yellowstone Park in Montana. It always grows in places where there is much moisture throughout the early summer, in damp spots in the mountains, or moist meadows. The climate of this region is quite cold, but dry in summer. Doubtless the thermometer reaches 20 to 40 degrees below zero at many points where *C. nitidus* thrives. I am justified in saying that my experience has proved it to be what its habits would indicate, one of the easiest of *Calochorti* to cultivate successfully.

C. longibarbus.—In this species we have a smaller flower of the same general type as *C. nitidus*. The petals are lavender, with dark purple circular band above the gland, and some long silky hairs around it. It has the same habits as *C. nitidus* and group. It is found in the eastern portion of the state of Washington, in moist fields and meadows. *C. pavonaceus* is so near the last as to be hardly worth separating.

C. Greenei.—Has a stout branching stem with broad petals, lilac in colour, somewhat barred below with yellow, and the lower part densely covered with long yellow hairs. It has never been introduced into cultivation, and is little known north of Mount Shasta in California.

C. Howelli.—The erect stem is a foot or more in height, and many-flowered, the petals white, covered with short, crisp hairs, those about the gland greenish. This unique and charming species is found only in a few spots in south-western Oregon. It grows only in a deep sticky clay, and the bulbs are as much as a foot deep in the ground. It is probable that it will prove quite amenable to culture.

GROUP II.—*C. Weedi* is a species with many forms which merge almost imperceptibly into each other. It can be recognised at all times by the single large radical leaf, which is almost exactly like that of *C. albus*, and is from 1 foot to 2 feet long and half an inch or more wide, by the heavy coating of coarse stringy fibre on the bulb, and by the long silky hairs on the petals, each of which is seated in a brown dot. The stems are tall and branching, the flowers large, and the gland small and nearly round.

C. Weedi and its forms are plants of Southern California. In the rather arid region behind the coast line they are found growing in the sand and grit of the dry mesas as the tablelands are called. Oftener they grow in the shelter of the stunted bushes which can sustain life in such soils.

The type, known as *C. Weedi*, has an orange-coloured flower, and the hairs are yellow. Often the petals are almost square at the point. *C. Plummerei*, also known as var. *purpurascens*, has a full, well-rounded petal, lilac or purple in colour, with the hairs of the same colour. *C. Weedi*, var. *vestus*, has the petals cut about half-way off, and with brownish hairs on a reddish-brown ground.

C. obispoensis is an extreme form, in which the petals are reduced to mere rudiments, while all the hairs, which are scattered over the petals of the full-petalled varieties, seem so dense upon the small remaining surface. It is a very fantastic form.

These forms are distributed from south to north in the order that I have given them, and there are many intermediate forms besides. The fullest petalled forms are in the arid regions farthest to the south-east, the most attenuated petalled forms to the farthest northern point of their habitat.

GROUP III., *C. CLAVATUS* AND GOLDEN BOWL MARIPOSAS.—In this the petals are yellow throughout, the lower half covered with hairs, each of which is tipped with a little translucent knob. The stems are stout and zigzagged, the leaves are long linear and deeply channelled, and of a bluish caste. They grow only on dry rocky points in peculiar volcanic formations and at widely separated spots for some 400 miles in the hottest portions of California. There are several variations, two of which have been given horticultural names. Var. *El Dorado* has immense bulbs, a very tall, stout stem, and great

light yellow flowers which grow to over 5 inches in diameter. Var. *Ventura* has a lower stem with very rich golden flowers. It is much easier to grow, and is a fairly good garden plant, and is the one figured in the first number of *FLORA*.

C. concolor.—A straight stemmed, large-flowered, clear yellow species. If more than one the flowers are in umbels. The bulb is large and reddish, and all parts of the stems and leaves are covered with a bluish bloom. The petals are a rich yellow tending to orange, and the lower third is densely covered with long erect hairs. This species was first named *C. luteus*, var. *concolor*, by Mr. Baker, but it has nothing in common in habit or style with *C. luteus*. It grows in the arid regions of Southern California. A splendid plate of it was published in *The Garden*.

C. Kennedyi.—As it grows in its desert home the stem of this is very short (1 to 4 inches), the base leaves long, slender, and channelled and bluish, as is the entire plant; the petals a dazzling vermilion and destitute of hairs, except for a few about their base; the gland is small, round, and densely matted with hairs. It grows in dry gravelly or clayey tablelands in the Mohave desert. In dry seasons there is not enough moisture to allow it to flower at all, but when the desert gets a fair rainfall they are very beautiful. The species extends through Southern Nevada and Arizona, where the flowers are from orange to creamy yellow. *The Garden*, February 2, 1893, contained a fine plate of the typical form.

C. aureus.—This resembles *C. Kennedyi*, flowers bright yellow. It is from the arid Great Basin region. One collector reported it as growing in *marl*, and some specimens are labelled as coming from sand cliffs in Southern Utah. I distributed a few bulbs some years ago, but I doubt if it has ever been successfully grown.

C. macrocarpus, the Green-Banded Mariposa.—A unique and very striking species, which is very widely distributed in the region east of the Cascade Mountains in Oregon, Washington, and British Columbia. It has a large bulb, a very stiff erect stem and large flowers, the petals of which are narrow, ending in a long point, and of a shiny lilac purple, with green bands down the back. There are a few hairs on the lower part of the petals, and a densely hairy gland. Altogether it is beautiful and unique. It grows on the dry tablelands of that semi-arid region among the sage brush and bunch grasses. There is a pure white form of it.

C. Gunnisoni.—Like the Oregon Mariposas, this has a single radical leaf which, is shorter and less prominent than in the last group. The stems are a foot or so high with a single bulblet at their base. At the apex is an umbel of from one to four

creamy white flowers. Usually there is a band of dark blue just above the gland, which is narrow and nearly the width of the petal, and densely covered with short greenish hairs. It is found in the southern Rocky Mountains, and is one of the most beautiful of all Mariposas. I am informed by a gentleman living in Central Pennsylvania that it can readily be naturalized in that latitude, and that his only trouble arose from the fondness of the rabbits for its leaves.

GROUP IV., BUTTERFLY TULIPS.—In this group of closely-related species the bulbs are small, the stems slender and wiry, the base leaves very long, slender, and deeply channelled; at the base of the stem there are small bulblets; the petals are usually large (except the type of *C. luteus*), richly coloured and with eye-like spots, and beautifully marked with hairs and pencillings. The gland is not large and from round to oblong in *venustus* to crescent shape in *luteus*. There are a few hairs about the gland. All but *C. luteus* type and *C. Vesta* are considered by bulb dealers as varieties of *C. venustus*. It is questionable if any other class of plants in the world surpasses these Mariposa Tulips in the variety and beauty of colour and markings, and they are among the easiest Calochorti to grow. The variations are innumerable, and the local variations so blend the varieties that all could not possibly be enumerated. I give all that have received horticultural names.

C. luteus.—A dwarfish species with small yellow flowers, destitute of an eye, but prettily pencilled about the gland. The gland is lunate in form. It grows in cold clay soils in a narrow belt of country at a distance of from three to fifteen miles from the ocean from Monterey to Mendocino counties, California. In other localities there are tall slender varieties of this, none of which are equal to the type in beauty. Var. *citrinus* (*C. venustus*, var. *citrinus*).—This lovely species has a deep yellow or lemon coloured flower with a dark maroon spot in the centre of each petal with other pretty pencillings. All those which have reached flower growers come from a region a few miles wide and perhaps thirty miles long in Sonoma County, Northern California. The variety is widely distributed in California with many variations, most of which are pale and not clearly marked. Var. *oculatus* (*C. venustus*, var. *oculatus*).—Taller and with flowers larger and more numerous than the last. The petals range in colour from white to cream and buff and to purple. In the centre of each is an eye-like spot of brown surrounded with yellow. About the gland they are beautifully pencilled. The gland is lunate. This lovely species is scattered all over the unforested regions of Northern California, where it grows on clayey uplands and southerly slopes. It prefers a shallow light clay soil where moisture is plentiful in the winter season.

The variations are innumerable. The form known in cultivation is the best ; it comes from Mendocino County, California. In my garden I have grown it with petals 2 inches long and as wide. Wild plants, too, in good conditions, grow as large. Var. *robustus*—At an elevation of about 3,000 feet, in El Dorado County, I found a form, evidently related to the last-named species, growing in a very dwarfish form in low, wet, and cold meadows. It grew among the coarse sedges, which are found in such places, and, but for the very vivid markings, would have hardly commended itself to my attention. I noted that instead of the single bulblet borne on the stem of the typical *oculatus* it had a string of from three to five nearly spherical bulblets. In cultivation they quite lost their dwarfish habits and showed surprising vigour, and bore large flowers. Undoubtedly they are the result of untold generations of plants fighting with untoward conditions and acquiring great vitality and powers of reproduction. As garden plants they will, when the finer colour forms have been rectified by selection, be second to none.

C. Vesta.—Tall large flowers with exceptionally long lateral stems. In colour the petals are white tinged with lilac and marked with a broad band of rich maroon across the lower third. The gland is distinct in being narrow and like two lunate glands placed side by side. It bears from three to five large offsets at the base of the stem, which if undisturbed move away from the parent bulb at the beginning of the second season, and flower the second or third season thereafter. In *The Garden* of October 12, 1895, there is a fine plate of *C. Vesta*. Its distribution is very peculiar. East of the Redwood region in Mendocino and Humboldt counties, Northern California, there is a belt of mountains and valleys in which the Oak predominates with many open hillsides and valleys. Here and there a deposit of a black or blue, very cold and tenacious clay is found. These deposits are often but a few rods across and seldom over a few acres in extent, and only in them does *C. Vesta* grow. The little colonies of bulbs may be separated from each other by miles of other soils, but know what they want and take nothing else. As Mendocino County has an annual rainfall of from 28 to 60 inches and is cold (as low as 12 degrees), *C. Vesta*, with its foliage exposed to daily freezing for some weeks each year, meets rather trying conditions. In cultivation it has amply proved its vigour and is the best of all *Calochorti* as a garden plant, thriving in any loam. Indeed, I have never seen that it did any better when given a heavy clay soil than in sandy loam or a porous made soil. Increasing as it does in a geometrical ratio by means of its offsets, it will, if undisturbed, become so crowded as to starve itself. I have seen seventy-five bulbs in a clod the size of a man's fist.

C. venustus (true).—In this the glands are oblong or inclining to round. The colouring is through a wider range of tints than in the forms preceding, and the markings more varied. In most of the variations there is an addition to the eye in the centre of the petal of a red or gold blotch at the apex of each petal. The seed-pod is linear, while in the preceding form it is arrow-shaped. As I have said, the forms of *C. luteus* grow in open glades, on warm slopes, or on clay uplands. On the other hand, the forms of *C. venustus* grow in open woodlands, or among brush, and usually in sandy or light soils. There are sections of the Sierra Nevada mountains where the two species meet, and there their tastes in soil and situation are well shown. In the open wet glades, where the soil is heavy and wet in the rainy season, *C. luteus* and its variations will be found in abundance, while in the woodlands and open brushy country all around, and to the very edge of the glades, *C. venustus* thrives, yet neither crosses its soil boundary. In the coast ranges I have found *C. venustus* on hillsides on a southerly exposure, growing among low bushes or tall perennials.

C. venustus type.—Horticulturally known as *C. venustus roseus*, and can be told by its broad wedge-shaped petals, white or creamy in colour, with a blood-red blotch at the top of each petal. It is widely distributed in the coast ranges of California, from the extreme south to the southern side of San Francisco Bay, and has many forms. In two localities it sports, as do the El Dorado forms, and, like them, to every shade of white, pink, purple, and red. Thousands of flowers in these spots could be picked, no two of which would be alike. As a rule, it is low-growing, but at its extreme northerly extension there is a form which is among the tallest of the Butterfly Tulips and, unlike most of the strain, very vigorous. Very curiously, this strain seems to have been developed by the plants being in the region where sticky clays, similar to those in which *C. Vesta* is found, crop up in the vicinity of its natural sandy habitat, and this strong strain, I doubt not, has originated in the effort to adapt itself to a cold and uncongenial soil. Be that as it may, the plants in this one locality are several hundred per cent. more vigorous and larger than those elsewhere in the coast range. Var. *sulphureus*.—In one or two localities in which the typical *C. venustus* grows yellow-flowered forms occur, and in a few places these become the predominating type. Var. *purpurascens*.—Tall, strong-growing, with purplish flowers, much darker on the back of the petals. They have the eye of the species, but are destitute of the red blotch at the apex of the petals, which mark the type. They have the same habit as to bulblets as *C. Vesta*, and, like it, grow only in a black or blue, very sticky clay, and at intervals from San

Francisco Bay to Monterey County in Northern California. Like all Mariposa Tulips which are native to the heavy clays, they are exceptionally vigorous and very easy to grow. Var. *El Dorado*.—At from 2,000 to 4,000 feet in altitude in the southern half of the Sierra Nevada a form of *C. venustus* occurs, in which the variations are innumerable. All have rather narrow petals of a long wedge shape. In every case there is a richly-coloured eye in the centre of the petal, with many markings and pencillings on the lower third about the densely hairy gland, while in some there is a red or gold blotch at the apex, as in the type. In colour they vary from white through lilac to purple, through pink and salmon to rich deep red, and through cream to very light yellow. In one locality one colour predominates, in another section another. Presumably this is in obedience to some natural law. In some places the variations are absolutely bewildering, and thousands of flowers could be selected and no two alike in colour and markings.

The prevailing soil is a granitic sand, and the plants grow in an open Pine forest and in the little glade-like openings. There are, however, outcroppings of several other formations in which the *Calochorti* also thrive, and the only spots in which they will not grow are the low wet glades where *C. luteus*, var. *citrinus* and var. *oculatus*, are found.

GROUP V., LILAC MARIPOSAS.—The type of this group is *C. splendens*, and the strong characteristics are in the white, lilac, or purplish petals, having no eye-like spot, and possessing a very small, round, densely-hairy gland, with some scattered hairs about it, and in long, very narrow channelled leaves. Nearly all of the kinds are from Southern California.

C. splendens.—The type of the species is the var. *atroviolaceus* of gardens. In this the stem is bulbiferous at the base, very slender, tall, and many-flowered. The flowers are smaller than in most species, colour of petals from lilac to purple, with often a deep purple claw and short hairs on the lower third of petal. Often the gland is absent. It grows along the coast of Southern California, and on the islands along the coast, on bushy hills and tablelands, and is a very excellent plant. Var. *montanus* is a low slender form found in the high mountains of the interior, where, I am informed, it grows in wet places. The colour is from salmon to pink. It is in cultivation as *C. Palmeri*. Var. *major*, a tall species, with few flowers and without bulblets at the base. The petals are pale lilac with long cobwebby hairs on the middle and pale at the base. The flowers are large and showy, but as a garden plant it is inferior to the following. It is found in the dry interior of the coast range of Monterey County, Northern California. Var. *ruber*.—This is the tallest and strongest of the series. The

petals are from a delicate satiny pink to lilac, with a small round gland and short hairs at the base of the claw. It grows on a high mountain range in Eastern Lake and Napa counties, Northern California, and is the most northerly representative of the species. It grows in a peculiar bluish sticky clay, often in rocky ledges, where the bulbs are sometimes pressed as thin as a wafer. I have dug them where the work was much like quarrying. In loose soils it grows as much as 15 inches deep. It ought to prove the hardiest, as it is the most beautiful, of the Lilac Mariposas.

C. Palmeri.—A little-known species, very like *C. splendens*, var. *montanus*; white to very light purple. It has never been in cultivation, and is known only at a few spots on the western edge of the Mohave desert in the mountains. *C. invenustus* is another species of this group, which will probably prove to be an extreme variation of var. *montanus*.

C. Catalinae (*C. Lyoni*).—This most charming species is of the habit of *C. splendens* (var. *montanus*), tall, slender, and large flowered. The stem is bulbiferous at the base, the petals from white tinged lilac to lilac purple, with a large ovate maroon spot at their base. The gland is oblong and densely matted with hairs, and a few hairs are scattered on the lower third. The seed-pod is oblong, not arrow-shaped or long and slender, as in all other Mariposas. *C. Catalinae* blooms earlier than any other Mariposa Tulip, coming only a little after the Globe Tulips.

C. excavatus.—Somewhat resembling *C. invenustus*, as described by Professor Greene. It has a broad hairy gland, which is so deeply set as to appear as a yellow sac on the under side of the petal; the colour of the petals is white, shaded with lurid purple above, and the original locality is southwestern Nevada. I have only seen dried specimens.

C. flexuosus.—In this beautiful species the stem is so weak and flexuous as to be almost creeping. The flowers are of much the same form as in *C. splendens* type, and purple with a deep purple claw. It is one of the most strikingly coloured of all *Calochorti*, and grows in an arid region in the extreme southern portion of Utah, in a red granitic soil. In seasons of heavy rainfall it is abundant and very brilliant, while in dry seasons few flower at all. I have not been successful in flowering it.

C. striatus.—A species known for some time but only recently described by Mr. Parrish. It has affinities with *C. Palmeri*. The gland is acutely triangular and densely tufted with white hairs, the petal is pointed at the tip, light purple striated with darker purple. It grows only in saline meadows, in and about the Mohave desert in Southern California.⁵

C. Dunni.—In this very pretty species, whose affinities are to *C. splendens* type (var. *atroviolaceus*), the habit is tall, and there is no bulblet; the petals

are white, with a reddish-brown band across the base, the gland is small, round, and hairy, and there are short scattering hairs on the base of petal. At first glance it would be called a white *C. splendens*, and is a native of the mountains of San Diego County, California.

GROUP VI., SEGO LILIES.—In these the stems are umbellate, with a very prominent bulblet at the base; the gland is round, the flowers very large and handsome—lilac, white, yellow, or pink. They are, with one exception, natives of the Great Basin and the arid regions east of the Rocky Mountains.

C. Nuttalli.—Stem rigidly erect, a foot or two high. The petals in the type are pure white, yel-

lowish below, and often marked with maroon. There is no more chastely beautiful flower than this lily of the desert. In some regions the flowers are yellow, in some pink, and in others wonderfully varied. In the early days of Utah the Mormons were often nearly starved, and the edible bulbs of the "Sego Lily," as they called it, were very acceptable food. They have made it their State flower. *C. Leichtlini* is a smaller flowered alpine form. I have often seen it flowering at an inch in height, or even with the cup set in the sand. The petals are smoky white, with a dark spot at the base.

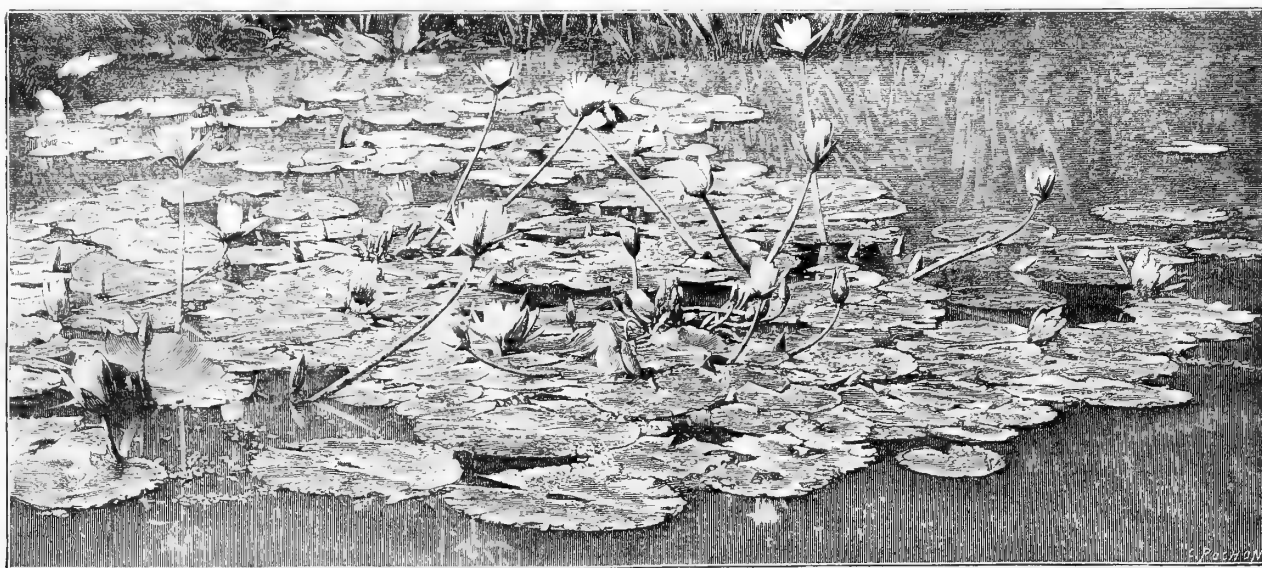
Ukiah, California.

CARL PURDY.

A GROUP OF BLUE WATER LILIES IN THE OPEN AIR.

DEAR SIR,—THE following particulars relative to the blooming in the open air of the blue Water Lily (*Nymphaea stellata*, var. Berlin) may interest some of your readers. The first plant, for which I was indebted to the kindness of Mr. Moore, of Glasnevin Gardens, Dublin, flowered vigorously in a pond during the summer of 1901, and in the autumn was lifted after the first frost and gradually dried off in a tub. Towards the end of February of last year (1902) the crown appeared to be dead; but closer

throughout the summer not to allow more water into the pond than would make up for the loss from evaporation and soakage. By this means the danger of any sudden fall in the temperature was diminished. The soil used is derived from the old red sandstone formation, and contains 75 per cent. of moderately fine sand. The "top spit" of this soil was mixed with one-third part of well-decayed horse manure and peat litter, and the mixture was placed in the pond on the top of the puddling-clay. This clay



NYMPHAEA STELLATA, BERLIN VAR.

In Mr. R. H. Beamish's Garden at Ashbourne, Cork.

examination disclosed the fact that eighteen small offshoots had sprung into existence. These were divided and were grown on in separate tubs filled with water and placed in a greenhouse, where the temperature varied from 45° to 70° Fahr. The young plants developed rapidly, and some were finally placed in a pond in the open air in May. The crowns were placed within six inches of the surface of the water, which nowhere exceeded a depth of more than 2 feet, and great care was taken

consists of 55 per cent. of small angular sandstone fragments, coarse and fine sand, and 45 per cent. of clay and organic matter. There are only traces of lime. The result has been that as many as twenty-six flowers and buds have been counted on a single plant, and the plants have continuously flowered throughout the past summer and autumn.

Yours faithfully,

R. H. BEAMISH.

Ashbourne, Glounthaune, Cork.

THE GREATER TREES OF THE NORTHERN FOREST.

THE multitude of learned-looking names of trees and the regrettable existence of many worthless kinds lead us to think that an account of the really great trees of the northern forest would be useful in fixing the mind on essentials as to kinds in serious planting. In catalogues and books one Latin name seems as good as another, and consequently a great deal too many worthless kinds and their varieties are planted. Not only have we false generic names, like *Retinospora*, but not a few true ones that are of little value from a forest point of view. Among trees of the Pine tribe, which are the best of all trees for the evergreen forest, there is a curious tendency to vary, which is sometimes laid hold of to create new names. A mere sport or distortion noticed on a tree, if capable of propagation by grafting or cutting, is given a Latin name and sold on the same printed level with true trees. If we go into a grove of wild Yew trees, like that at Kingley Vale, we see a striking diversity of form, and it would be easy in such a case to pick out "varieties" and name them.

The essential thing to be borne in mind is that the wild type of a forest tree is the best, and that sports are worthless. Trees raised from seed vary a little naturally, as in the case of the wild Yew; different forms of habit and closeness may be seen in the same wood, and this is an interesting fact to be enjoyed without going any further where re-naming can only do harm to planting. So we begin with a tree of the highest value from every point of view for our islands, and we hope to continue with the greater trees of the northern forest lands of Europe, northern Asia, and America.

NO. I.—THE CORSICAN PINE.

Of all the Pines that have been brought to our country this, from a forest point of view, is the most precious, the most rapid in its growth, hardy, and finest in effect. In beauty nothing excels our native Fir, which is also a rapid grower, but under equal conditions the Corsican Pine is even more rapid in growth, while isolated it has a nobler aspect, owing to its mast-like stem. By itself, on a heath in Surrey, I have seen it as strong and clean in the stem as any grown in the massed wood, while our native Fir is apt to branch out and suffer much when isolated. For freedom of growth the Corsican Pine is extraordinary, if planted young. It has the repute of not being eaten by rabbits, but when hard pressed for food I find they will attack it, and where the rabbits abound it is only less liable to be attacked in severe weather than other Pines. Very young plants, if protected for the first two or three years, will put up with a good deal from grass or briers,

and the growth is surprisingly rapid and beautiful. The climate of our country suits it admirably, and it is not particular about soils, thriving in poor Sussex clays, on peaty heaths and sandy hills, in conditions that are not forced, as they usually are in pleasure ground planting, by digging holes and putting several loads of earth round a tree. In that way we can get no proof of the value of a soil in relation to the growth of any Pine. The growth of the Corsican is spread over a good many acres in the natural and often poor soil of the country; sometimes planted without even ploughing, and without manure or other addition to the natural soil. It is a common thing to trench ground, and a very expensive labour it is; but in planting many thousands of these trees not an inch of the ground has been trenched. This makes a serious difference in the cost to the planter; and after the first few years of growth I doubt if any good to the final growth of timber is done by trenching. These observations arise from a successful planting of the tree in Sussex.

Plantations in Wales and Ireland.—Mr. A. D. Webster gives in the "Transactions of the Scottish Arboricultural Society" a good account of the growth of the Corsican Pine in Wales.

"On this estate (Penrhyn) this Pine has been planted extensively. Many fine trees are to be seen ranging in height from 50 to 70 feet. As a fast-growing ornamental tree, or for planting in exposed situations it is invaluable, and at present bids fair to outrival all others. A plantation of over thirty acres, situated at 500 to 700 feet above sea level, was some years ago formed of it, planted 16 feet apart, the intervening spaces being planted with Larch and Scotch Firs. For planting in exposed situations or within the influence of the sea, this Pine is excelled by none. Along the outskirts of plantations fully exposed to the south-west, from which point our worst winds blow, the Corsican Pine is far superior to the Scotch Fir, and about equal to the Austrian Fir, as a screen. Where the Scotch Fir becomes weatherbeaten and, as it were, shrinking or bending from the blast, the Corsican stands boldly out, as if to defy the storm, its head above any of the surrounding trees. This is noticeable in clumps and strips of trees that were planted half a century ago in the park here for shelter and effect. Near the sea coast this Pine grows with a vigour excelled by few, and seems quite at home, even within the direct influence of the salt spray; and for this reason, as well as its ornamental appearance, it has been largely used to form sea-side plantations. On the mountain side between Llandegai and Aber, at

altitudes ranging from 300 to 500 feet above the sea, where thirty years ago extensive plantations were formed, although used to a very limited extent, it may be seen above any of the other trees, boldly facing the south-western blasts, which, at times, sweep along the hill sides with terrific fury."

A like encouraging report was sent by Lord Powerscourt to *Woods and Forests* some years ago, and he now writes again in high praise of its continuous success in Wicklow, after a trial of many years. Mr. J. Dempson, writing as to N. England: "You may safely plant Corsicans up to 1,000 feet anywhere in Britain as far as I have seen—no matter how poor the soil is or thin, provided it is dry." So that we have every reason for believing that it is the tree of trees for the adornment of the hills and shores of our islands, as one cannot well have more diversified conditions than those that obtain in a southern county like Sussex, in Northern England, on the Welsh coast, and on the Irish hills, success being marked in all.

Varieties of the Corsican Pine.—According to the books there are several varieties of this Pine, but these are mostly based on comparisons of dried plants in herbaria, and the men who write the books do not always take the trouble to see the living tree. Such questions as stature, colour, soils, quality of timber, hardiness, quickness of growth, they rarely mention, merely labelling the specimen as a variety, because it resembles something else in the herbarium; and this way is called "science" in the language of the day, while observations on the essentials mentioned above are called by another name. If we stand in a field planted with the hardest Pines we could scarcely find two more unlike than the Corsican and the Austrian Pines, which are very often grouped together as varieties. From the planter's point of view nothing could be more erroneous or misleading. It is not unlikely that other kinds grouped under this name may also be distinct from our point of view; what, however, is clear now is that there are two forms of this grand Pine. The Calabrian and the Corsican are both Pines of the highest value. It is just possible that thorough knowledge of the Calabrian would make it also distinct as a species; but of its value we have no doubt whatever.

The Calabrian form is less planted in Britain, because good seeds and growing plants are not easy to obtain; but this surely will not always be so, as South Italy is no longer, we hope, in the hands of brigands. It was introduced into France by M. L. de Vilmorin about 1820, but has not yet taken the place in forest cultivation which its merits entitle it to. Its properties are of the first order; it is second to none as regards size; almost cylindrical in form, it is without lateral branches. During

visits to Des Barres we were struck by the fact that the Calabrian Pines were, amongst conifers of the same age, those which showed the finest growth and the greatest amount of wood. The foliage is somewhat stronger, and less twisted than that of the Corsican form, and its branches are, if anything, stronger, but without showing any tendency to development at the expense of the trunk. Its shade is thicker than that of the Corsican Pine, and it adds the rapid growth and good form of the Corsican to the hardiness of the Austrian. Unfortunately it is not easy to obtain. Its seed is scarce, expensive, and often unproductive, so that the plants are rare.

Quality of Timber.—The timber value of this noble tree has to be considered, but as most of our plantations in Britain are not mature, we have to seek the testimony of those who know the tree in its native state.

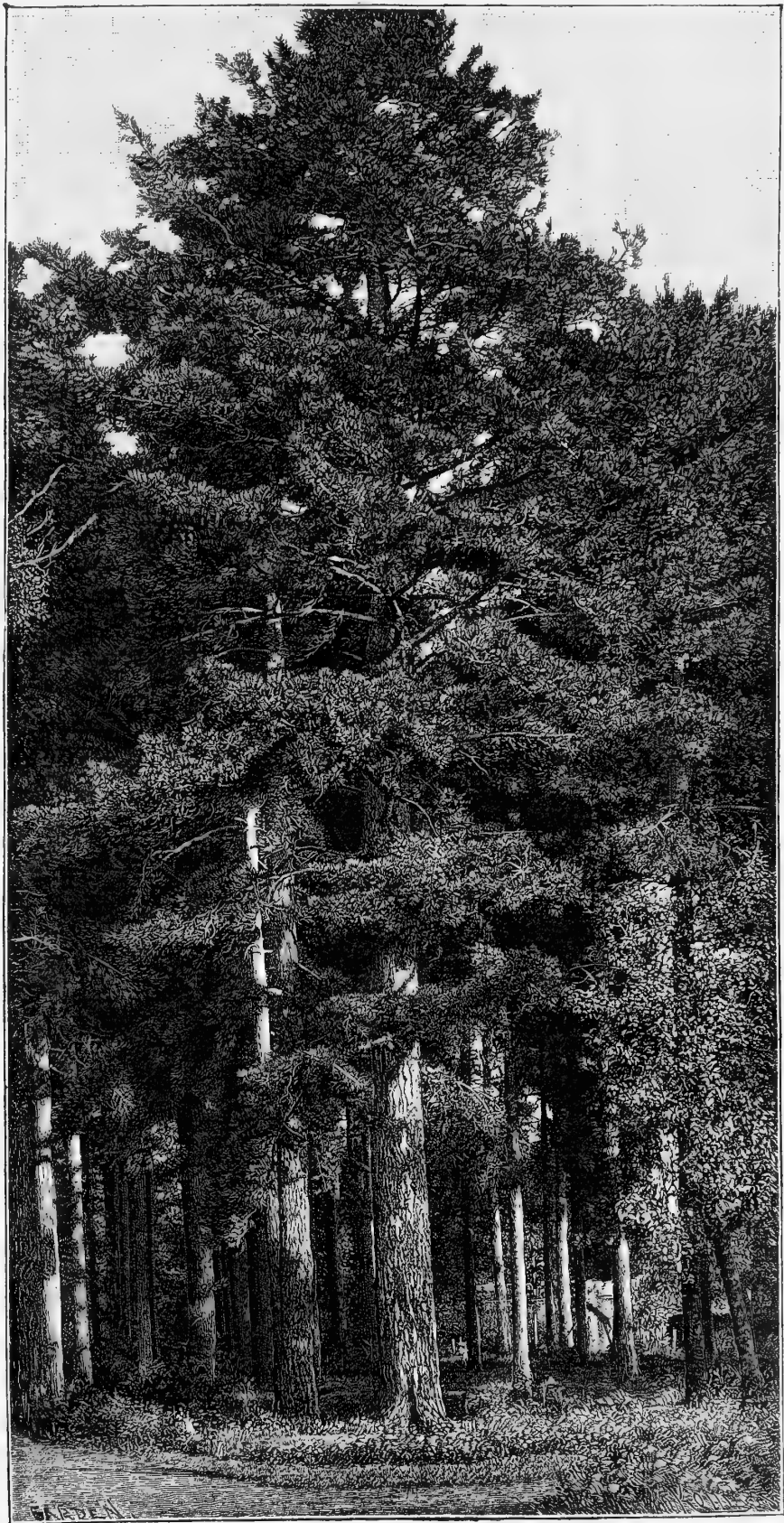
The wood of the mature Corsican Pine is considered as good, and, in Central and Southern Europe, in conditions resembling somewhat those of its native habitat, is to be preferred to that of the Scotch Fir, which is in far less congenial surroundings there. The value of the Corsican Pine in shipbuilding is great; the wood is fine and close in grain, and the stem perfectly straight, the resin abundant. According to Matthieu (*Flore Forestière*), the timber of the Corsican Pine is white in very abundant layers, and varies from a rose red to a brown red according to its position. The autumn tissue of each layer is clearly marked and of relatively great thickness. The resin ducts are very plainly seen, and contain a thick turpentine, which, by filtering through the tissues and impregnating them with abundant resin, often renders the wood as hard and translucent as horn. The wood has a fine close grain. The timber of this Pine is excellent for building. The evenness of its annual growths, joined to the fine dimensions which it attains to, gave rise to a hope that, like *P. sylvestris*, it would furnish masts of the first size, but experience has not justified this hope. The wood of the Corsican Pine is too much charged with resin and too heavy; its fibre is short, as is proved by numerous small cracks produced by desiccation; it is wanting in suppleness and is brittle. The French naval authorities have for these reasons refused to use it for masts, for which purpose it is used in the Italian marine. This excess of resin where it exists also renders the wood less valuable for industrial purposes; yet it furnishes planks for the Toulon Arsenal, and there is no doubt it makes excellent and lasting sleepers for railways.

The qualities of the Corsican timber are, besides, variable, and an attentive study of the circumstances—formerly little known—which determine these

qualities will doubtless govern the production. It seems, however, permissible to affirm that, considering the slowness of its growth, its value will always be very high, and that to regulate this it will be proper to consult much less the dimensions of trees and the thickness of the last annual layers than the volume and development of the perfect wood, which alone is useful.

Planting and Sowing.—Mr. D. Cannon, an Englishman living in France, and an extensive planter of evergreen forest trees, writes: "Having regard to the high price of seed of the Corsican and Calabrian Pines and its generally middling quality, we think it preferable to plant out than to sow and more economical. The plants ought not to be taken up before the day, or at most the evening before planting out, and if brought from a distance, they ought to be sheltered from the sun and wind up to the moment of planting. It is as well not to plant on hot, scorching days, which sometimes occur in spring, and only to plant in still, overcast weather. Having regard to the lightness of the foliage, the plants ought not to be given more space than 4 feet between them in all directions, because the contact of the branches of the young trees will better enable them to keep down weeds. If this Pine is set amongst other evergreen trees, the space may be a little more, say 6 feet, having regard to possible losses and to the density of the other trees, which ought never to be allowed to dominate the Pines. Care must be taken to see that those who do the planting do not, for the sake of regularity of spacing, plant the Pines under clumps of other kinds of trees.

As regards sowing, the common mistake is to sow too thickly, increasing the expense and producing an over-thickness of growth, which, though pleasant to look upon during the first few years by reason



CORSICAN PINE (DES BARRES).

(Engraved from a photograph by Maurice L. de Vilmorin.)

of the vivid covering of verdure which it imparts to the land, soon results in sickly and stunted plants, unless careful thinning is resorted to. In order to avoid such a result, it is a very good plan not to sow broadcast, but in lines; this will ensure the health of the seedlings and make the thinning at a future time much more easy. A kilogramme of seed contains on an average 40,000 seeds. The seeds are larger than those of the Scotch Fir and smaller than those of *P. maritima*. The percentage of non-productive seed is generally higher than in the case of either *sylvestris* or *maritima*. The right quantity to sow, having regard to the probable failures, is 7 to 8 kilos the hectare."

As to planting, Lord Powerscourt in *Woods and Forests* is clear and sound: "The plan adopted by me was that usual in Scotland—notching, viz., the planter, with a spade made for the purpose, cuts the surface in the shape of a cross, and by reversing the spade turns up the four corners of the soil, when a boy following him with a bundle of plants drops one into the hole, and the planter, holding the plant upright with one hand, treads down the notch again over the roots with his foot.

"This is all that is required with plants from 9 to 15 inches in height, the best size for planting; and as the sides of the notch hold the plant quite tight when pressed down on each side of it, it affords more protection, and prevents the roots being shaken after being put in, which would be fatal to the success of the tree, as every experienced planter knows. The great thing is to plant firmly, so that, although, of course, the plant itself may be exposed to the wind, the roots shall be firm and steady in the ground, as any plant which is liable to have its roots moved after once being placed in the soil will certainly die."

The Tree in its Wild State.—The Corsican forests are among the finest in the world. The trees attain their utmost size and beauty in positions that are from 4,500 to 6,000 feet above the sea level, and in gravelly soil created by the decaying of the granitic rocks. In the Aitona forest, trees 140 to 150 feet high are not uncommon, their circumference at 3 feet from the soil varying from 16 to 18 feet. Such trees may be 400 years old; the growth, at least in height, is less after the first 100 years. In the Calabrian mountains, at nearly the same altitude as in Corsica, it has been ascertained that some of the Calabrian forms of this Pine are fully 180 feet high, and bigger in all their parts than the Corsican ones. Those trees are chiefly used for naval construction. In several forms this Pine is a native of Spain, Corsica, Mount Etna, the Calabrias, Thessaly, and Asia Minor, where it clothes the less lofty of the mountain spurs. The Corsican forests, being under the control of a forest department, are natur-

ally the best known. It is to be desired that the Calabrian were better known, and seed and plenty of that fine form more easy to obtain.

A Visit to the Trees in Corsica.—A visit to the Corsican Pine forests is described by Mons. Maurice de Vilmorin in the *Revue Horticole*. "You must make haste," we were told, "if you wish to be in time to see what is left of very old trees and forests in a state of nature." An excursion to Corsica was organised in 1897 by a band of friends who were to compose the caravan. These included M. Ed. André (who, however, left us ere his trip was half begun, recalled by stress of business to Paris, not without regret, perhaps), my brother, and Mr. W. Robinson, of *The Garden*. The party, thus reduced to four, reached Ajaccio under the guidance of M. Doumet-Adanson, a Corsican by adoption if not by birth. At Ajaccio we met with a very cordial reception from the Conservator of Forests, who also imparted to us some very valuable information as to the present state of the forests. M. Mabaret was also good enough to mark us out an itinerary, which was to enable us to see the very finest examples of trees that was possible in the time of our excursion. Such information as we were able to obtain will be valuable alike to tourists and tree lovers.

The forests of Corsica are for the most part very easily accessible at the present day, thanks to the Department of Bridges and Highways, which has constructed some marvellous roads. The limitations of our visit necessarily debarred us from visiting the more out-of-the-way forests, approached only by way of mule tracks and mountain paths, and where the very oldest trees are to be found still standing in isolated grandeur in the rockiest and least accessible situations distant from the conserved forests, to which peculiarities of situation they owed their immunity from the axe of the contractor. The finest forests visited by us were those of Aitona, Valdoniello, Vezzana, Marmano, Bonifato, the four first being situated in the arrondissement of Corte, and the last in that of Calvi, and all traversed by good roads. Those of Valdoniello Marmano offer the easiest opportunity of seeing the finest trees in the most picturesque surroundings.

The best specimens of the Pine we met with were not more than 18 feet in circumference. Seven or eight years ago there was still standing at the base of the Valdoniello forest two trees known as the King and Queen, both 27 feet in girth. Frequently enough, we saw trees that measured $12\frac{1}{2}$ to 15 or 16 feet in the bole. Some of these trees were more than 130 feet in height, but the average height of fine old trees is 115 feet. In the forest of Marmano, close to the pass of Verde, the trees are to be found, which are at once the loftiest and the best shaped,

in such fine dimensions as $10\frac{1}{2}$ feet and $13\frac{1}{2}$ feet in girth, and 131 feet and upwards in height; these growing in clumps of their own species, or with a strong admixture of Beeches and some Firs. The Pine in its best state is met with in Corsica on the slopes of the mountains, with a northern exposure, commencing at an altitude of 2,950 feet about (the limit of the maritime Pine); they are found as high as 5,900 feet. Here they become rare, not, however, that they are unfitted to thrive at this altitude, because strong specimens of this Pine are to be found at the uppermost limits of the forests, notably at Aitona and Bonifato, but because these heights are the summer pasture of flocks of sheep and goats. Outside this elevated zone, natural propagation by seed is easy; the risk the young forest stands most in is that of fire during the hot dry summer months. The more ancient parts of the forest run less risk, the stems being stripped of their lower branches, and the undergrowth having generally been choked off by the Pines. One sees these clumps as thick and

regular as in the continental forests of Norwegian Pines and Silver Fir in some parts of the forest of Aitona, which is one of the most regular as regards density.

It is, however, at the highest edges of the forests that the Pine is seen in its most picturesque aspect. In these regions the trees grow wider apart owing to the conditions of their existence being much harder and, especially, to the browsing of animals, which hinders the growth of the majority of plants, thus reduced to the condition of Japanese conifers. In its struggles with wind and snow the tree is of lower growth, the stem thickens, throwing out some powerful branches, the top shoot is obliterated, and the summit takes a flattened and spreading form. Looking at some of these Pines as they can be seen close to the pass of Saint Pierre, which forms the dividing line between the forest of Aitona and Valdoniello, it is difficult to persuade one's self that they are not Atlas Cedars, as they grow on the highest summits of Algeria.

A FINE YELLOW CLEMATIS.

(*Clematis tangutica*.)

It is fifteen years since I received from one of my correspondents, under the uncertain name of *Clematis petropolitana* (?), a plant which appeared to bear a strong relationship to *C. orientalis*: there were the same vegetation and the same form and colour of leaf. On the evidence of this apparent similitude it was given the same treatment as *C. orientalis*; that is, it was cut down rather short after the winter and before the rise of the sap, to rid it of the old wood and to make sure of a fine bloom on the new year's shoots. But not a flower appeared, and I was beginning to accuse the new arrival of ingratitude, when a branch that had eluded the knife one fine spring day showed large rounded buds at the end of its long peduncles, and very soon afterwards the flowers opened like large gold buttons, different from what I had expected and much prettier.

From that time I knew what I had to do with. To timely moderation on my part I owed the abundant blooms of the following spring.

In my opinion, however, it is an error to classify it as a variety of the Eastern clematis. Certainly, in the immense area of its distribution, from the Cyclades to Manchuria and the north of China, crossing the Caucasus, Persia, Afghanistan, the Himalayas, Nepaul, Songaria, the Pamirs, and the Altai mountains, *C. orientalis* can possibly count some different forms corresponding with soils and climates so diversified. But all those we know bloom in summer and autumn on the branches of the same year, while the flowers of *C. tangutica* come in the spring on the last year's wood. No

confusion need, therefore, exist for the man who has cultivated the plants and seen them flower.

The difference is fundamental, and sufficient, I think, to justify the inclusion of the Tangut plant in the ranks of distinct species. But it is further distinguished by other marked characteristics: the flowers are much larger, of a fine golden yellow colour—not pale yellow—the sepals thick, fleshy, not contorted, but well displayed and slightly reflexed at the tips, their consistency and appearance being waxlike. The peduncles are much longer, and the leaves, though of like form and colour, are more deeply indented and to a greater extent.

This plant, which flowers at the same season as the large-flowered mountain clematis, possesses a high decorative value. Its vigour is very great and it attains great dimensions. It is absolutely hardy, having passed unscathed through most severe winters, including that of 1893, when at Lyons the thermometer showed 26° and 30° below zero. It flowers abundantly in the spring, and the colour of its blossoms is unique. Its seed, even in their large, silky, silvered tufts, are pretty, and mingle pleasantly with the flowers that adorn trellises, old walls, or the sides of rocks. Frequently it happens that some more vigorous of the year's shoots bear isolated and tardy blooms. It is very easily increased, either by cuttings under bell glasses or by grafts made on the roots in the usual manner. Very young plants have a tendency to go back in winter; this may, however, be remedied by making grafts and cuttings as early as possible in the spring.—FRANÇOISQUE MOREL.

THE GARDEN BEAUTIFUL.

HOME LANDSCAPE AND HOME WOODS.

ALTHOUGH our main object is to describe the treasures of the world of trees and plants, the neglect of any study of planting or of garden design from an artistic point of view makes us resolve to give a place to it. Recent talk there has been plenty, but much of it is nothing more than what the old books tell us—not a tenth part of what we shall have to think of in the planting of a country place if we are to get the best our site and conditions allow of. Anyone may plant and lay out a garden if he is content with stereotyped plans; but the question is a much larger one, and concerns many important things which have for their object the best effect that can be got from the vast treasures at our disposal. It is not only the health of the trees we have to think of, but their placing in right ways; light and shade, breadth, and what artists know as “composition,” dignity, and simplicity in planting, the right adapting of beautiful living things to surface, soil, and climate.

Recent writing has led to much confusion and obscuring of the essentials at issue, and now the photographer has come in to confuse us more and more with dread examples of ugliness and extravagance. He is usually one who knows or cares little of the beauty of a country place in wood or landscape, and who takes point blank aim at any showy thing about the house. His results show a hideous waste of ugly pattern beds with scraps of miserable plants, costly and wearisome stonework out of place, and all the ugly aspects of the bastard Italian garden as understood in Britain, with seldom a visible trace of true design. If we think of the cost of all this, and its evil effect on the minds of the many who mistake it for what is best in gardening or planting, we may well be amazed at the stupidity that mistakes it for art, or endures it in the foreground of a fair landscape. Therefore we propose to publish articles of things good in garden design, and to consider the larger question of laying out the home landscape of country places, and also the woods and planting near. We intend to illustrate this when good examples are found, in the hope of making clear the central truth, never yet shown in any book: that it is in variety and not in conformity that beauty must be sought.

HOME WOODS.

At the beautiful gate of the woods one happiness awaits us: we are not beset by vain considerations about “styles,” of which most works on garden design are made up. And our home wood should be only a nobler kind of garden, and may be so treated without in the least spoiling its value as a wood.

We may see on a spring day in one place more beauty in a wood than in any garden, from the bushes and plants wild in the place: Furze, Crab, Cow-

slip, Wood Hyacinth, Primrose (on northern slopes), Marsh Marigold (in wet copses), and Sloe. But this great beauty often has to be looked for through briary paths and dense underwood, and the best of it is not brought into easy connection with the home grounds. In many country places, where people labour for years with a wretched stereotyped kind of garden, they take no trouble to see the beauty of the wild bushes and plants that grow naturally near them, without cost or care. Even the supreme beauty of our native trees is often a sealed book to them, while they perhaps spend time and money on tender trees, useless and ugly in our land either for wood or garden.

The wood is a mighty worker for man, a precious gift of beauty as well as profit. For the wood, unlike the farm, wants few costly labourers, no weeding or ploughing, finds its own manure, does its own watering, finds its own shade and shelter, and does all this and much more work, and without the aid of the colleges now thought necessary to make the good gardener or farmer. Moreover, if all the wit of man, backed by all the learning of the colleges, were on one side and a wood of our best native trees on the other, the wood would certainly give a better return than could be got from any labour or capital applied to the same class of land in other ways.

EVERGREEN WOODS FOR BEAUTY AND PROFIT.

Even in the most frequented lines of country we are often dismayed by the ugliness resulting from the neglect of planting the most precious gifts of the hills—the Mountain Pines. With few exceptions the best of these are the trees of northern Europe and America, massed in serried armies on the mountains, and grown on the hilly ground to a vast extent in central Europe. There are good reasons for planting evergreen woods, and the first is beauty. This we do not get in the kind of pleasure-ground planting in which the object is to grow each tree as a specimen dressed down to the ground as in a green “crinoline.” It is only by grouping and massing hardy evergreen trees that we can see their highest beauty, which, in most kinds, lies in the mast-like stem. Nothing in the form of trees may so much influence the look of the country as these evergreen trees. But a few other reasons for their planting are here given.

In open continental countries, where the winds are powerful enough to destroy the crops, shelter-belts of evergreen trees are a great defence. Much

Shelter. more so in our wind-shorn coast land we have reason to seek shelter; no country is more in want of it. If we neglect, owing

to the vast length of exposed coast, to give shelter, the trees and shrubs are cut off as by giant shears above the walls. But where we have the evergreen wood (beginning with wind-resisting shrubs working up to the higher trees) we have perfect shelter, as at Bodorgan in Anglesey, on one of the most wind-shorn coasts.

In dealing with poor land the question of profit cannot be excluded, and to what better use could one put bad land, poor rocky slopes, starved sandy flats, boggy hills (as in Ireland), and wet districts, and land too cold and poor to be ploughed with any profit, as in some southern wealds? There is no way we can use such land so well as by planting it with the true evergreen forest trees. There is no Saturday night in the woodland; it puts on its profit without other care, adorning and sheltering the land and helping the various living creatures that haunt the woods, adding in many ways to the charms of the country. Few know the power of these trees to grow on the poorest land. We cannot grow Oaks on nothing, but I have seen young Pines sow themselves on land from which the top soil had been entirely removed by gold hunters. Many poor, cold, ill-starred hill-sides of the north of England, Wales, and Ireland could grow the Mountain Pines as well as they grow in their native lands. The Corsican Pine makes a growth of from 20 inches to 3 feet a year in a quarry I know from which every bit of soil has been removed.

Another reason for choosing evergreen trees for planting poor land is that woods can be so quickly raised. If we make a right choice of young plants, and wire against rabbits and hares before planting, we may raise sheltering woods in ten years. Little plants, after a few years' struggle with the turf, settle with it, and are soon tall enough to give us the shelter and effects which only evergreen woods can give.

Our climate helps us if we only know how to take advantage of it, because of its affinity to the sub-alpine conditions in which the great Pines of the world so often grow—the land below the snow line. All the Pines of Europe are easily grown as forest trees in our country, because the conditions are something like those of their natural climate. If we go to North Africa we find the Cedars growing far above the wide sea of arid hills where the snow lies late, among our wild flowers and our Thorn and Yew growing with them. A man after middle age could easily raise noble woods of these trees in his lifetime, while a young man, owner of a poor, treeless estate, might clothe the hills with a stately forest.

In the country house, all the cooking and heating might be much better done with wood fuel; the British kitchen range is a costly fraud, and if all our coal mines failed, every country parish might grow its own fuel and light. Yet it is a common thing to see people bringing coals from Newcastle and carting it miles from a railway station, whilst abundance of fuel lies rotting in their woodlands. The very wealth of Britain in coal has been our loss, in leading us to forget the old ways of cooking and warming. The architect and the housemaid, and the modern grate

and chimney, are all against us, so it is not uncommon in a country house to see people shivering round an ugly grate with a coal fire. Our evergreen wood is, it is true, not such a good fuel for the open fire as the native hard woods—Oak, Beech, Ash, or Maple—but for closed ranges and furnaces it makes a good fuel. I have lately been staying in a country house in Hungary, where all the cooking was done with wood, there being thirty-five people to provide for. Even the electricity for lighting the house and offices was generated from the grubbed stubs of Fir trees which in this country would be left to rot. Every cottage on the estate was warmed with wood only, and with perfect comfort.

The objection to the greasy coal of northern England, apart from its cost, is that it pollutes the air of the country as well as that of the town, and many good gardens and country houses are defiled by it. I have placed in cottages a wood-burning kitchener which answers well, and the people are grateful for the cleanliness and the good cookery and baking done with it. The fuel we use is such as may often be had in old shrubberies and underwoods—batwood it is called—of slight value in the district. Some simple means of cutting it up is all that is needed as to economy.

As some of the Pines grow 3 feet a year in soil too poor for any agricultural use, but few words are needed to give an idea of the enormous amount of firing that may be grown in this way, even from the mere thinning of the woods. And here and always it should be said that we must in all these cases follow the true forest way of close planting, only thinning when the thinning will pay for the labour, when the trees to remain are close enough to keep the shade canopy overhead.

Another reason for giving more thought to the woodland as a nobler kind of garden is the lovely colour of trees throughout the year in good planting.

Tree Colour. Mr. J. Meehan, writing to an American paper, describes the trees of England as “keeping up their dark green-hued foliage to the last!” He must have left us too soon, as our woods are often full of colour right through the autumn, some of the American trees—where people have the art of grouping them in an effective way—having as fine a colour in our country as in their own. It is a delusion to suppose that our native trees have not fine colour, for scarcely one of them is not remarkable for it. The Oak woods around London are superb in colour in fine autumns, and the Beech woods nearly every year from Scotland downwards. To the artistic eye, open to delicate gradation and variety of good colour, that of British woodlands is quite as good as any other, not forgetting the winter effects, often most beautiful, from that of Alders by the busy stream to Oaks massed close with silvered stems. Almost every native tree and wild shrub is beautiful in colour of flower, leaf, and fruit. Scarlet Dogwood, red and yellow Willows, Gorse,

Broom, Holly in berry, Mountain Ash brilliant in fruit, our native Barberry (a lovely thing in fruit in groups), the Spindle Tree, and Viburnum, are among our trees that give the most showy effect; but for refined colour that of our common woodland trees in picturesque planting is best of all. The colour lacking in many districts, however, is that of the nobler Pines, with their fine variety of perennial verdure from the Hemlock, Spruce, and Yew, that toss their branches so finely in storms, to the silvery Californian trees and the trees of noble stem-colour—Scotch Fir, Yew—and, indeed, nearly all Pines in a mature state.

(To be continued.)

TREE NOTES FROM ROCHESTER (THE FLOWER CITY).

AMONG ornamental trees characterised by their showy inflorescence, as well as by the beauty of their fruits in autumn, none may surpass many of our native Thorns; and, perhaps, no region is as rich in the variety of this genus as the immediate surroundings of Rochester and the district of the famed Genesee Valley, justly termed "The Garden of the Empire State." In several recent visits to this section, the eminent botanist, Dr. Charles S. Sargent, author of "Silva of North America," discovered many new species and varieties of the *Cratægus*, some of which he has described in *The Botanical Gazette* of February 1902. Illustrations of some of the most distinct types of these, when secured at a later date, may prove of interest to the readers of *FLORA AND SYLVA*.

In recalling the Thorn, however, two other well-known native flowering trees, the Shadblow and the Dogwood, perhaps equally picturesque in their grace of contour and drift of snowy bloom, should not be lost sight of, whether imparting an added charm to their natural habitat or supplying a vivid ornamental adjunct to the home-grounds. Of these three graces among native flowering trees of medium growth, the Thorn or May-tree alone possesses in most of its forms the added charm of pronounced fragrance. The common English Hawthorn or quick, so largely employed as a hedge-plant in Europe, does not always weather the severity of our winters in some of the northern states. It is, moreover, apt to become sunburned, and suffers from mildew and the attacks of the aphid. Many handsome specimen trees of the double English Hawthorn, however, lend a lovely note of colour to many of our gardens.

In the list of comparatively new and little-known trees may be mentioned a variety of the handsome Sugar Maple, *Acer saccharinum*, var. *monumentalis*, a stately tree of pyramidal habit, very regular in its growth, and distinguished for the brilliant crimson colouring of the second-growth foliage. Another comparatively new Maple is a purple-leaved form of

the well-known Norway Maple, *Acer platanoides*, var. *Geneva*, raised in the town of that name in this state. This is a variety of robust growth, quite distinct from Reitenbach's or Schwedler's, and that may be said to combine the good qualities of each. Other trees of recent introduction are the globe-headed Norway Maple, with a perfectly rounded head, and Thurlow's Weeping Willow, a graceful pendulous tree with leader of erect growth and drooping side branches.

Among ornamental flowering trees and shrubs which, though not unfamiliar, are not nearly as well known abroad as they deserve to be, are *Pyrus angustifolia*, or Bechtel's double-flowering American Crab, perhaps the most interesting of the genus when laden with its exquisite violet-scented, rose-like flowers of delicate pink, in early spring. Still more showy in its snow-white vernal garb is a form of the favourite Japanese *Deutzia*, *D. crenata*, var. *Pride of Rochester*, a variety raised and disseminated by Ellwanger and Barry from *D. crenata*, fl. pl., producing large double white blossoms, the back of the petals being slightly suffused with rose. Excelling all the other sorts in size of flowers, length of panicle, profusion of bloom and vigorous habit, it also blossoms nearly a week earlier than *D. crenata*, fl. pl.

A word of praise may likewise be added with reference to a new native Elder, *Sambucus canadensis acutiloba*, just introduced by the Mount Hope Nurseries—a distinctly novel and highly ornamental shrub, surpassing *S. heterophylla*, the well-known fern-leaved variety. This will form a fine companion for the cut-leaved Sumach; and, with its deeply and delicately cleft dark green foliage, it will become valuable on account of its graceful beauty, as well as its perfect hardiness, rapid growth, and the ease with which it bears transplanting.

GEORGE H. ELLWANGER.

Mount Hope Nurseries,
Rochester, N.Y.

COLLECTIONS OF OUR DAY.

BELGROVE.

MR. W. E. GUMBLETON'S garden at Belgrove is situated on the great island of Queenstown, which has a circumference of about twelve miles ; Queenstown, Fota, and Belgrove being nearly equidistant from each other and four miles apart. Blessed with a fertile soil, ample shelter, and a climate unusually mild and genial, the locality is a land of gardens, and many rare plants, both hardy and half-hardy, and some even which are reputed tender or extra-tropical, thrive and luxuriate there in the open air.

The Belgrove garden is agreeably situated on a sunny slope that runs down to one of the creeks connected with Queenstown Harbour, and over which crosses the "East Ferry," a name commonly also employed to indicate the locality generally. The Master of Belgrove has for a long time been known as an energetic amateur gardener, and apart from the genial natural position, the scenic beauty of the grassy lawns, and fine trees of his ancestral acres, he has long been a specialist so far as the testing of new trees, shrubs, and flowers are concerned, be they of British or Continental introduction. No pains, personal labour, or reasonable expense has been spared in the acquirement of botanical rarities at home or abroad, for at least a period of probation or for permanent culture according to their merits, from a broad and liberal-minded or proprietorial point of view.

Belgrove is dominated by a personality at once independent and critical, and as a trial garden it occupies a place unique in Ireland, even if not in Great Britain as well. It must not be for a moment thought that the place is wholly devoted to testing novelties. There are always plenty of old and well-tried things here for use as well as beauty—a well-stocked kitchen garden and fruit orchard, vineries, etc.,



EUCRYPHIA PINNATIFOLIA.

and I have never yet visited Belgrove without finding the conservatory near the entrance a blaze of colour and redolent with perfume. The finest of Tuberous Begonias and Pelargoniums, Cannas, Crinums, Amaryllis, Nerines, Arctotis, or Gazanias and other choice composites are all found here in their season; and the capricious *Disa grandiflora* from the misty top of Table Mountain also does splendidly here, and I counted lately some seventeen pots of it in perfect health and freshness, some of the growths being as bold and vigorous as ever I saw them anywhere. In the enclosed garden you may see new or rare fruits of many kinds, the Lovetberry, Logan-berry, the Iceberg or White Blackberry, Lucretia Dewberry, Raspberry, and Strawberry, or the bird-fertilised *Fiejoa Sellowiana* of Brazil, a large-fruited myrtaceous plant, which, although it has wintered and flowered in the open air, has so far not fruited here. Whether its non-fruiting be due to the climate, or to the absence of its feathered friends, is a question, however, that only time and further experiment and observation can settle.

There are ample supplies of choice vegetables and fresh herbs for every day in the year, including the precocious crimson-stalked Rhubarb, obtained from Santa Rosa, where Luther Burbank is helping Nature to improve herself in his experimental garden.

Some few years ago Mr. Gumbleton took up the culture of all the best of M. Latour-Marliac's new seedling Water Lilies, and as he has been eminently successful with them, his system of growing them may be described for the information of others who would like to adopt his method. The Nymphæas are grown in two brick tanks, the one 21 feet long by 9 feet broad and 3 feet deep; the other, 31 feet long and 8 feet broad, and 2 feet 6 inches in depth. These tanks are elevated 18 inches or so above ground level, so that when in flower their gorgeous and shapely flowers are near the eye. All the best kinds are grown, such as *N. Marliacea rosea*, *Luciani pygmæa*, and *pygmæa Helveola*, *chromatella*, *sulphurea*, *grandiflora*, etc., *N. gloriosa*, *ignea*, *rubra punctata* (syn. James Gurney), *sanguinea*, *Andreana*, *Robinsoni*, *Ellisiana*, *W. Falconer*, *W. Doogue*, *James Brydon*, *tuberosa*, *Richardsoni*, and, of course, the best variations of *N. Leydekeri* and *N. odorata*. Amongst other of the hobbies indulged in by the Master of Belgrove is a special liking for the Torch Lilies, or Flame Flowers (*Kniphofias*), and for all the best green-leaved and variegated Cortaderia or Pampas grasses.

Amongst the former were noted the following :—

K. Pfitzeri.	K. nobilis pallida.
K. Phœnix, Max Leichtlin.	K. Star of Baden-Baden.
K. præcox, a rare old kind. (First to bloom.)	K. Henry Cannell, one of Pfitzer's best seedlings.
K. recurvata.	K. spectabilis.



CRINUM POWELLI ALBUM AT BELGROVE.

K. grandis.
 K. President Cleveland.
 K. Jules Chretien.
 K. Hoffgartner Fiesser.
 K. John Benary, fine orange.
 K. multiflora, white flowered.
 K. T. S. Ware.
 K. George Bruant.
 K. floribunda.
 K. Lachesis.
 K. Saundersii.
 K. Obelisque.
 K. Surprise.

K. R. Wilson-Ker.
 K. columnaris, a fine variety of
 K. uvaria, of which the only
 stock existent is here.
 K. Rooperi.
 K. rufa.
 K. Sirius.
 K. Matador.
 K. Edouard Regel.
 K. Emperor William.
 K. erecta.
 K. W. E. Gumbleton.
 K. serotina.

The varieties of Pampas Grass, or Cortaderia, include the best white and rosy-plumed kinds : *C. jubata* (= *C. quila*), best variety ; *C. aurea variegata* ; *C. Wesseringhi*, silver variegated ; and *C. Stenackeri*, best silvery variety.

One of the features of Belgrove is the luxuriant growth of trees and shrubs existent there. On the lower lawn are two very noble old evergreen Oaks, quite different in habit, the one semi-pendulous, the other more erect and bushy in habit. These trees are believed to be 200 years old, and the larger of the two is 60 feet in height, having four main stems or boles of large size. An oriental Plane of large size and very graceful habit is also a special feature, either in winter, when its elegant limbs and twigs are bare, or in summer, when clothed with its deeply-cut and glossy foliage. Other rare trees are the Golden Chestnut of Monterey (*Castanopsis chrysophylla*), a specimen second only in size and age to the tree in Earl Ducie's collection at Tortworth. *Juglans ailantifolia* is a distinct grey-barked tree, with long pinnate foliage of quite a palm-like or sub-tropical character.

Another rare Walnut growing here is *J. hybrida*, var. Royal, and Paradox, two of Luther Burbank's varieties, and said to be valuable as fruiting trees. There is a fine bush of the Box-leaved Holly (*Ilex buxifolia*), and a healthy and well-coloured specimen of *Cupressus macrocarpa aurea*. *Plagianthus Lyalli* also does well here. There is a long wall in the upper garden, beautifully draped with Magnolias, Wistarias, and other climbing or trailing plants, including the true *Ampelopsis Engelmanni*, one of the best of the so-called Virginian creepers, as it clings firmly to the wall and colours better than *A. hederacea muralis*.

Perhaps the most interesting of the new plants on trial this year are composites, viz., *Aphanostephus arkansanus*, with creamy-white and pink flowers ; *Xanthocephalum gymnospermum*, with full yellow flowers ; *Tridax gaillardoides*, with yellow inflorescence tipped with white, and very free blooming.

There is also a new Sea Lavender (*Statice chinensis*), and a Toad Flax, named *Linaria pancici*.

The Wistaria, both purple, single and double, do well here, as also does *W. multijuga*, a kind producing flowering racemes nearly 2 feet in length, and which now and then bears fruit. *Buddleia Colvillei* originally flowered here on a wall in 1891, and was afterwards killed back to the old stem by 29° of frost, but grew away freely again afterwards. This fact is mentioned as showing that, genial and mild as the Belgrove climate usually is, it is nevertheless subject at times to severe depressions with the usual results. *Carpenteria californica* also does well outside on an old red-brick wall, along with *Eucryphia pinnatifida*, and the still more rare *E. cordata*, the foliage of which resembles that of a large and glossy-leaved evergreen Oak or Ilex in form and texture. Apart, however, from named and well-known plants—the rare Californian shrub, *Crossosoma californicum*, and the yellow tree Pæony (*P. lutea*) from China, are the most recent additions—there are always at Belgrove many things on probation that are new, rare, uncommon, and often unknown; and it is this which adds so much to the interest of the garden and its surroundings.

As some indication of the number of rare and interesting plants that have flowered from time to time, and often for the first time, at Belgrove, we append lists of plants which have from time to time appeared in *The Garden*, *The Gardeners' Chronicle*, and in the pages of *The Botanical Magazine*.

BELGROVE PLANTS FIGURED ON COLOURED PLATES IN *The Garden*.

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| 1. <i>Adenocarpus decorticans</i> . | 5. <i>Gazania bracteata</i> and varieties. |
| 2. <i>Brodiaea laxa</i> and varieties. | 6. <i>Hunnemannia fumariæfolia</i> . |
| 3. <i>Buddleia Colvillei</i> . | 7. <i>Iris stylosa</i> and its varieties. |
| 4. <i>Dimorphotheca graminifolia</i> . | |

PLANTS FIGURED ON WOODCUTS IN *The Gardeners' Chronicle*.

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| 1. <i>Fritillaria pluriflora</i> . | 12. <i>Gymnopsis uniserialis</i> . |
| 2. <i>Cortaderia Lambleyi</i> (syn. <i>Wes-serlinghi</i>). | 13. <i>Hazardia detonsa</i> . |
| 3. <i>Dracæna Doucetti</i> , fol. var. | 14. <i>Helichrysum Gulielmi</i> . |
| 4. <i>Pyrus coronaria</i> , fl. pl. (Bechtels). | 15. <i>Leptosyne gigantea</i> . |
| 5. <i>Cortaderia jubata</i> (syn. <i>Quila</i>). | 16. <i>Allium Erdelii</i> . |
| 6. <i>Deutzia discolor purpurascens</i> . | 17. <i>Arctotis decurrens</i> . |
| 7. <i>Cortaderia argentea</i> (fine specimen). | 18. <i>Eupatorium petiolare</i> (<i>Purpusii</i>). |
| 8. <i>Grindelia patens</i> . | 19. <i>Arctotis Gumbletoni</i> . |
| 9. <i>Tagetes Lemoinei</i> . | 20. „ <i>stæchadifolia</i> . |
| 10. <i>Asclepias Halli</i> . | 21. <i>Helichrysum Gulielmi</i> , var. <i>Meyeri</i> . |
| 11. <i>Cryptostemma lusitanicum</i> . | 22. <i>Helichrysum Volkensii</i> . |
| | 23. Seed-pods of <i>Wistaria multijuga</i> . |

BELGROVE PLANTS FIGURED IN *The Botanical Magazine*.

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|--------------------------------------|---------------------------------------|
| 1. <i>Calceolaria depressa</i> . | 8. <i>Buddleia Colvillei</i> . |
| 2. <i>Disa atropurpurea</i> . | 9. <i>Gazania pygmæa</i> . |
| 3. <i>Brodiaëa Howelli</i> . | 10. <i>Cortaderia jubata</i> . |
| 4. <i>Olearia ilicifolia</i> . | 11. <i>Iris Grant-Duffii</i> . |
| 5. <i>Eremurus himalaicus</i> . | 12. <i>Convolvulus macrostegius</i> . |
| 6. <i>Cypripedium californicum</i> . | 13. <i>Helichrysum Gulielmi</i> . |
| 7. <i>Senecio laxifolius</i> . | 14. <i>Arctotis Gumbletoni</i> . |

EVERGREEN TREES IN THE EASTERN STATES.

THE White Pine, Hemlock Spruce, and Red Cedar are a trio of evergreen trees found growing under the most diverse conditions from Canada to Georgia; and, although the ancient forests of them are now mostly but a memory, the value of these trees to the planter is very great. They withstand the extremes of heat and cold, drought and rain, and in beauty hold their own with the best.

A large plantation of the choicer coniferous trees made seven years ago is to-day an object-lesson of what may be planted in safety with satisfactory results. The extremes that prevail in the Eastern States—of great heat in summer, and zero temperatures, often accompanied with long-prevailing cutting winds and brilliant sunshine, in winter—make a trying test of fitness. Under these conditions some of the best coniferous evergreens have grown vigorously and well. A group of the Atlantic Cedar (*Cedrus atlantica*, the trees imported from England) is to-day a fine feature. In a high position exposed to the coldest winds sweeping across many miles of open country with absolutely nothing to break the force or temper the blast, these trees have grown rapidly and are in robust health. The Lebanon Cedar under identical conditions is an absolute failure.

Among the Spruces are some from our western States and others from Europe, all handsome and quite at home. Of native species the Colorado Douglas Spruce is making noble, graceful trees. It also shows marked and pretty variations, some trees assuming a glaucous hue almost equal to the best forms of Blue Spruce (*Picea pungens*). The Blue Spruce is a tree that cannot be too highly praised, and in support of this may be cited the grand trees planted by Mr. Douglas at Waukeegan, Illinois, where the conditions are more trying than here in the east.

The White Spruce (*P. alba*) of our northern country has proved excellent in New Jersey, and

is charmingly variable both in habit and of colour, varying from deep green to a silvery hue.

Of the European Spruces, *P. orientalis* is certainly one of the best. It is of rather slower growth than most others, but under all conditions makes a healthy, handsome tree, and so densely branched as to show little of its main stem.

P. omorika from south-eastern Europe proves very hardy, but slow growing. *P. excelsa* thrives admirably, and has been so popular with planters that one cannot refrain from wishing it had never been introduced. *P. ajanensis* makes a neat and graceful tree.

P. polita is a Japanese Spruce of great promise and noticeable for its rigid branching and the still more rigid sharply-pointed leaves entirely surrounding the branches. Of the various Firs by far the most important is *Abies concolor* from the Western States. It is a fast grower in any aspect or position. Along the coast of Massachusetts and Maine it has been planted freely in seashore gardens, and some of the handsomest garden specimens are to be found there, fully exposed to the fierce winds that sweep in from the Atlantic—winds that not infrequently drench the trees with salt spray, which they endure and grow as fast and as well as far inland. It should be tried under similar conditions in gardens on English coasts.

Nordmann's Fir has done admirably in our gardens and is always conspicuous with its abundance of deep green lustrous foliage. *A. cilicica* is absolutely hardy, thrives well, and is in every way good. The same may be said of the Cephalonian Fir. Two Japanese Firs, *A. Veitchii* and *A. brachyphylla*, have stood the test of hardiness, and present appearances betoken they will be handsome trees at no distant date.

A. HERRINGTON,
Madison,
New Jersey.

FLORA

AND SYLVA.

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AZURE AND BLUE FLOWERS IN THE WILD GARDEN.

THE greatest addition to simple and good colour that has ever been made to our garden and home landscape has been the growth of Narcissi in the orchard, meadow, or other grass. These flowers being so good and free and as hardy as the hardiest wild plant, nothing surpasses them for effect. Two common dangers, however, are often seen: first, overcrowding, in which the whole surface of the grass is dotted over; and second, the use of mixtures instead of distinct kinds. The first destroys all good effect; the second, as we see in some parks, is also the wrong way to go to work. It is only when the plants are grouped naturally and simply in the turf with plenty of verdure about them that we get their best effects. Nothing is weaker than a mixture of a number of kinds. We do not say that mixtures are not occasionally good: two well-chosen kinds very often go together with graceful result, but the best way is to keep the kinds apart. Even kinds which seen in the hand might be called second-rate often give, when grown in the turf, most beautiful colour, seen at a distance. However, the main object of this article is to show that we are only in the beginning of the refinements of the wild garden, and that to put Narcissi out freely, as they are now offered by the thousand, is only a small step compared to what we should take.

Another and distinct series of colours must be added to them, and the best are the azure and blue flowers of the mountains and northern pastures. It is when these are seen in relation with the Narcissi in the form of carpets near or beneath them that we get one of the most charming effects that any flower-planting can give. Apart from the beauty of these azure and blue flowers, there is the incidental gain of using them in the most effective way, and that which will give us the least trouble. Many of them are so short-lived in bloom, that if we occupied the flower garden with them they might be in the way of summer flowers, which we look to to last through the fine season. Not only is their bloom short-lived, but occasionally the season, like the present, is so severe that they may be cut off in their prime. Hence the advantage of using the azure and blue flowers, where they will be no trouble to us and we need only concern ourselves about them when we see them in beauty. For

example, the Apennine Windflower is a plant to which we cannot give much space in the flower garden, because it disappears very often with the hot days of April, whereas, forming a groundwork in some shaded lane with groups of Narcissi here and there through it, it will last longer because of the shade of the trees, and give a far higher degree of beauty than we could get in the flower garden, in consequence of the relief and varied light and shade it enjoys from the various picturesque things near. Also, most flower gardens are in the sun fully exposed, and, what is almost as bad, the hot sun which often follows frost. If we take advantage of the many shady and sheltered plantations, lanes, or grassy pathways about a country place, we may escape these harmful extremes; we may even put our favourite plants like these where they will not catch the morning sun, or on the north side of hills or groves where they will not flower so early in the spring, and so escape hardships.

As regards the beauty and effect that may be gained, the best idea will be given by describing some of the more useful plants for our purpose among the Windflowers and Forget-me-Nots, Grape Hyacinths, and other plants which flower about the same time as the Narcissi, the essential character of which is hardiness. The whole and the true meaning of the wild garden is putting hardy exotic plants in conditions in which they will take care of themselves and increase and give us no further trouble. The statement that the wild garden is a picturesque garden or a wilderness is quite erroneous, as it has a clear, simple, and special meaning.

GRAPE HYACINTHS (*Muscari*).—Among the plants which I find most delightful for grouping with Narcissi are several of the great groups of spring-flowering hardy bulbs. Most useful, because to be had in quantity, are the Grape Hyacinths, such as *M. comosum*, and our British Grape Hyacinth (*M. racemosum*). Any of this numerous family would, in fact, thrive that may be had in quantity, and we hope bulb merchants will offer them in that way, as they are so easily increased. Some of these do in any soil—even cold soil—and make a brave fight in the grass; but in warm, light, peaty and sandy soils they are very free. They are among the plants that can be put in meadows and orchards, and even places that are to be mown for hay, because the leaves and flowers both disappear early. The kind called Heavenly Blue, offered by Messrs. Barr, is a good one indeed, and has surprised us by the rapid way in which the smallest bulbs of it become naturalised. An effect we have repeatedly tried with happy results is that of Narcissi of the rather early season grouped among or near these Grape Hyacinths. There is a charm of colour about it which appeals to all.

BLUE WINDFLOWERS (*Anemone*).—The next group, the Anemones, give us the greatest service

of all, and chief among them for naturalising is the Apennine Windflower, which in many places, especially in free soils, grows even more freely than our own wood Anemone. In Ireland, on the limestone soils, it runs as free as a weed, and it is very beautiful at Ham Wood, St. Ann's, and many other places. It grows anywhere, but does not run quite as freely in stiff soils or carpet the ground as it does where the soil is free or gritty. This present year the frost has been so severe that its time of blooming is shortened, especially on southern slopes where the sun comes out after hard frosts. While it grows anywhere, it is well to remember that its greatest charm would be, perhaps, planted in woody places, lanes, &c., because there the light and shade and the varied form of things help it. It flowers in the mid-season of Narcissus, and therefore it can be associated with many of them, and an effect to last a lifetime would be got in that simple way. It has a very thin little root, and should be transplanted or bought without drying and without delay.

The Greek Anemone Blanda is very precious, too. As yet it is not so easy to get in numbers, but it is delightful in the length and size of its flowers, fine colour, and in its perfect hardiness. The round, marble-like root is quite different from

that of the Apennine kind, and therefore not so risky to transplant in a dry state. This, until it becomes more plentiful, should be associated with the choicer smaller and earlier *Narcissi*. Until that time comes the rock garden or some of the choicer banks for the dwarf *Narcissi* would be its best place; but there is no delicacy about it, and it is sure to increase wherever encouraged, and is a plant charming for its associations as well as for its beauty, many of the hill-sides round Athens being covered with it in the spring.

THE HEPATICA.—An *Anemone* of the mountains of Europe and mountain woods of America, the *Hepatica* is one of the most free of early flowers, and I think the wild blue forms of it are by far the prettiest. Where in half shrubby places, in gritty and open soils, these plants do well they could hardly be surpassed in beauty of colour, particularly the single blue form of the common *Hepatica*. Equally important is the larger *H. angulosa*, which has not yet broken into varieties, and so the one we have is a good colour and free enough in many soils.

THE PASQUE FLOWER.—On chalk the lovely flowers of the Pasque Flower (*A. pulsatilla*) is likely to be most precious for the wild garden. Chalk soils, however, are not necessary, because if we put in vigorous young plants of this it will grow almost anywhere; but the most beautiful colour and the greatest abundance of flower on this plant is when seen on chalky soil, and in this our country is rich.

Lastly, we come to what many consider the best of all, that is, the azure-blue Windflower (*A. Robinsoniana*). This has an advantage on the blue Windflower in being as far as known a variety of a native plant, and therefore more enduring in severe weather; there is nothing that can surpass it in vigour, constancy, freedom of bloom, and refined colour. Larger in its parts than our common Wood *Anemone*, it is often more free to grow in poor stiff soils. It flowers about the mid-season of *Narcissus*, and thrives easily in grass or in conditions common about us, so that we can make the most charming of carpets from which handsome groups of *Narcissus* might spring. The many graceful novelties among Daffodils raised of late years might well be planted in or near carpets or groups of it.

FORGET-ME-NOTS (*Myosotis*).—In considering the blue flowers of the northern world in spring we must not neglect the Forget-me-Nots, of which, perhaps, the most charming for the wild garden is the common or true Forget-me-Not. As wild gardening will be so often and so readily carried out near a streamlet, a pond, or a lake, many opportunities will occur of associating the Forget-me-Not with plants likely to grow on the margin of water; and among these the *Narcissi* are among the chief, as we often find them growing on the margin of water

and giving their best effects there. In such a case, any boy can dot round pieces of Forget-me-Not and establish it. The common Forget-me-Not comes later than the *Narcissus*, but one very pretty one flowers about the same time and is excellent for our purpose, and that is the Swiss perennial Forget-me-Not (*M. dissitiflora*). This, though a perennial, in our mild and open winters, is apt to overgrow itself and disappear without leaving much trace, unless we take care to give it a place where it cannot do so, that is to say, on some grassy bank where there is little competition with other things, as we have lately seen it growing at Forde Abbey. It is a plant of charming colour and a fitting companion for the choicest *Narcissi*. As lovely as any is the wood Forget-me-Not (*M. sylvatica*), which, in half-shady or woody places, is among the fairest flowers of the spring; and, as in such places we may often grow *Narcissi* to the best effect, that is the place for their association. This Forget-me-Not is very apt to sow itself and go on from year to year, and in good, moist soils will grow as high as 18 inches: it is a lovely thing for cutting for the house. The way to increase it is from seed, and, by the way, the seed is not always good that is sold.

WOOD HYACINTHS (*Scilla*).—The group which gives us our beautiful Wood Hyacinths must not be neglected in the wild garden, the most important kind being the Spanish Wood Hyacinth, very free in open soils. Much earlier in the year the Taurian *Scilla* is effective and good in colour; the Siberian *Scilla*, too, is vigorous and blooms for a longer season than most kinds, thriving well in heavy soils, which all exotic bulbs do not. It may not run through the soil as quickly as many things do, but it is very important for certain effects. Allied to the *Scillas* are the Snow Glories (*Chionodoxas*), certainly the most precious among hardy bulbs of these colours that have been introduced in our time—distinct, very pretty, and extremely free and hardy. I think certainly the most lovely flowers among blues brought to our country of recent years is one, *C. gigantea*, which, when established on heavy soil, gives us not only good colour, but a play of different colours in the same flower. We do not know if these plants will run through the grass as rapidly as the Apennine Windflower or Blue-eyed Mary, but they are well worth trying and encouraging in the wild garden.

OMPHILOIDES.—This is almost a Forget-me-Not, a charming wild garden plant, hardy anywhere and spreading about in a modest way among the Primroses or common dwarf plants. It is most excellent for association with the choicest Daffodils of the mid and early season. In some free soils in Ireland it runs about like a common weed, and there are acres of it at Carton.

THE GARDEN BEAUTIFUL.

HOME LANDSCAPE AND HOME WOODS.

(Continued from page 40.)

I HAVE shown in the first article reasons for the planting of evergreen woods : for shelter, profit, use of poor lands, rapid growth, varied uses, and for their beauty in the landscape. The man who does not love the woodland and the tree will never make a really beautiful country place ; for the questions which cluster round the house itself are as nothing compared with what we have to face if we wish to get the best the ground may give us. We have now to think of the chief question in planting, the choice of stately and first-rate trees ; kings of the northern evergreen forest they should be.

From many points of view, then, the planting of evergreen woods is an important one, and, from the number of merely new trees in lists, the question is not always very simple. We have a few hardy evergreen trees which everybody plants, but so many trees have been introduced, possessing good qualities in their own country, that people are apt to plant things which can never become in Britain timber trees of any value, however well they may look in nursery rows, or isolated in the pleasure ground with perhaps a dozen loads of good loam under each tree. The mountains of Europe give us the best trees for our islands, needing no special soil or care, and with them thrive the trees of Northern Asia and even Southern Europe and Asia Minor with its noble Cedars of Lebanon. There is always a gain in having a tree from a like climate. If we go to California and warm regions for our evergreens we may make mistakes, and costly ones, as many find with the *Wellingtonias*. There are certainly fine trees in the North Pacific region ; but for the evergreen wood we ought to take the hardiest trees only.

But we have to steer clear of many pitfalls made for us by catalogues in giving pompous Latin names to mere “states” or slight varieties of each tree ; of fine trees, not hardy save in favoured spots, as the *Deodar* and *Sequoia* ; of false names like *Retinospora* ; of failures like *Cryptomeria* ; of trees starting too early in the spring, owing to our open weather ; of weedy, poor trees like the western *Arbor-vitæ*, and to whole lists of poor varieties of such trees, absolute rubbish from a woodland standpoint, and, indeed, little better for the pleasure ground. The following are the best trees for the evergreen wood :—

FOREST EVERGREENS FOR BRITAIN.

The Corsican Pine.—The tallest Pine of Europe, reaching 160 feet high and over in Calabria and its own country, Corsica, and of very rapid growth in our country, as I have raised woods of it in ten years. The tree shows much variety of habit and

even foliage, and, if one liked to do anything so foolish, one could give Latin names to several forms found in one wood. The Calabrian variety has been reckoned as a species by some, as it is a more vigorous tree, especially in poor soils. A lovely

tree for all the southern parts of Britain at least and good in every way. Plant small; two-year-old plants do best.

The White Pine (P. strobus).—One of the noblest orest trees of the northern world, sometimes reaching a height of over 170 feet, with a girth of trunk of 30 feet. Owing to the cutting of the woods in Canada and Northern America, it is seldom seen in its native dignity in the settled parts. It forms dense forests in Newfoundland and Canada, and westwards and southwards along the mountains, and in our country thriving best in gritty and free soils. I find it often perishes when growing on wet clays, but this is not owing to any want of hardiness, as it is as hardy as any northern tree.

The Cluster Pine (P. pinaster).—A rapid-growing Pine of pleasant colour, 70 feet or more high, native of the Mediterranean region, often by the seashore, and useful in our country near the sea, but often thriving in inland places, best in free and sandy soils. It is used much in France to aid in fixing sand dunes.

The Scotch Pine.—Our native Pine, and, when old, one of the most beautiful. It is of very wide distribution in Northern, Arctic, and mountain regions, and also on the mountains of Italy and Greece. The Riga variety is considered a more erect and stronger grower. A great number of varieties are mentioned in books and catalogues, and some hybrids, compact and dwarf varieties, including variegated ones, none of any consequence compared to the wild tree. This Pine sows itself in rough heaths, and is rapidly spreading in that way in some districts.

The Monterey Pine (P. insignis).—A grass-green Pine of California, often thriving in the southern and western parts of our country, but in inland places occasionally suffering in hard winters, and therefore not good for general planting, except on high ground. The tree is so distinct and beautiful that it should not be forgotten in the southern and home counties.

The Swiss Pine (P. cembra).—A noble alpine Pine of distinct, close-growing form, and a slow grower in our country, as well as in its native land on the mountains of Central Europe or in Siberia, where it attains a maximum height of 100 feet. This is a tree of rare beauty and fine quality, its slow growth at first does not lessen its great value.

The Austrian Pine.—One of the hardiest Pines; distinct in form and colour, attaining a maximum height of nearly 100 feet, of close, dense growth when young, thriving on calcareous, poor, stony or rocky ground and on clay soils (but not on poor sands). Owing to its close "covert" and habit it nourishes the ground beneath it so well with its fallen leaves

that it is self-supporting and gives precious shelter. It is often planted in Britain, but generally set out in the usual specimen way, so that it is slower in taking its true form than when grouped as trees should be. The final form of the tree—which, so far, we hardly ever see in our grounds—is very picturesque, with a free open head, but, being a free grower and giving valuable wood, however grouped or massed it should be freely thinned so as to allow of its full development. In books this Pine is sometimes classed as a variety of the Corsican Pine, but, from a planter's point of view, the trees are as distinct as any other Pines in colour and form. I went last year to see this tree in Lower Austria, and thought it picturesque, but came away with my love for the Corsican Pine increased.

The Cedar of Lebanon.—Noble trees of the mountains of Asia Minor and India; some hardy. Planters should not forget that it is to the Cedars of the northern mountains they must look—the Lebanon and Atlas Cedars, which have been proved so hardy and so well fitted for our country. In books a form called *Cedrus atlantica* is considered distinct enough to merit a separate name, but, having seen the trees on their native mountains, I think the Atlas Cedar is the same species as the Lebanon Cedar (*C. Lebani*). The seed of the tree is plentiful in Asia Minor and North Africa, and it ought to be grown in forest nurseries and offered among the other forest trees. The seed being as easy to raise as that of any other conifer, we should not buy the tree in the "specimen" state but in the smaller state, a much safer way. I feel strongly that the Lebanon and Atlas Cedars should be grown as woodland and forest trees, and place them very high in the ranks of such.

The Common Yew (Taxus).—Our best native evergreen, though neglected by gardeners as a tree, must not be left out in forest work, as it is such a welcome shelter for game, and when old and grown as a forest tree should be very beautiful with its finely-coloured stem, everlasting verdure and life. In woods, too, we have the best chance of growing it out of harm's way, as no asp of tropic jungle is more deadly, and thousands of precious living creatures have been killed by Yew.

Lawson's Cypress (Cupressus Lawsoniana).—A tall and beautiful tree of the Pacific coast of North America, 100 feet high, and very free in our climate. Unfortunately, owing to propagation from cuttings instead of in the natural way from seed, the tree often breaks into a number of stems, which interferes with its natural habit and beauty. It varies very much into what is called "sports." There are a number of fastigate forms, but they are malformations, and only the natural wild form raised from seed should be planted.

The Yellow Cypress (C. nootkatensis).—A distinctly beautiful tree, hardy, a native of the northern Pacific coast, and with even more than the grace of the Italian Cypress. It thrives in cold, ordinary soils, and it is a pleasure to see it at all seasons. The English name of Yellow Cypress was given by the colonists of Vancouver's Island from the fresh wood being yellow in colour. Syn. *Thuopsis borealis*.

The Great Japanese Cypress (C. obtusa).—A beautiful evergreen tree of the mountains of Japan, better known in our gardens under the wrong name of Retinospora. It grows nearly 100 feet high, and in its own country it is much used to form avenues. It has many varieties with Latin names, but few of them of real value as they grow old, and these varieties and their Latin names and propagation by cuttings will no doubt do their sorry work in blinding us to the value of the wild tree. Only plants from seed are worth planting for woods.

The Douglas Fir.—One of the most valuable trees introduced. It is now a common tree in Scotland, for timber, and may at a glance be distinguished from other conifers by its dense soft green foliage on pyramidal trees a hundred or more feet high in the oldest specimens. It should be planted in sheltered valleys or woods, but will live in all soils ranging from light sands and gravels to moderately stiff clay. There are several varieties of the tree, that known as the Colorado variety being considered the hardiest. Its growth in Ireland is very fine.

The Sitka Spruce (Abies sitchensis).—In places where this Spruce thrives it is a beautiful tree with bluish silvery-grey leaves. In a damp climate where the soil is deep and moist it grows into a noble tree, but in dry soils it soon becomes poor. It comes from a very cold part of the northern world, and is a precious tree for Britain. I should place it among the best evergreen forest trees.

The Rocky Mountain Spruce (Picea pungens).—An American Spruce; a valuable tree for this country, as it is very hardy, quick in growth, and withstands exposure in high-lying places. It is most generally known in gardens by its variety *glauca*, which is perhaps the most silvery of all conifers, the whole tree being like a cone of frosted silver. This Spruce is largely raised from seed in order to select from the seedlings these silvery varieties, and it is the green kind which is of less value for gardens that is so useful for exposed plantations and shelter groups. I find this tree very good in poor stony and dry ground.

The Norway Spruce.—One of the most planted of trees, and yet often failing in the southern and dry counties, except near water or in wet bottoms. It is a mistake to plant it on high exposed places or in very dry soil, but over a large area of the western country it is valuable.

The Silver Fir.—A noble tree of the mountains of Central Europe, often planted in Britain, and growing well over 100 feet high in many places. It was the first of the Silver Firs planted in Britain, and one of the best. When young it grows well in the shade of other trees, and it is an excellent tree to plant for shelter, as it will grow in the most exposed situations, and in peaty as well as ordinary soils.

The Giant Arbor-vitæ (Thuja gigantea).—A tall and noble tree, fine in stature and form, hardy in our country, thriving in ordinary soils, and a free and rapid grower, even without the special attention in the way of soils such conifers often receive. It attains in its own country a maximum height of 150 feet, and its wood is fine-grained and good. N.W. America, finest on the Columbia river (syn. *T. Lobbii*).

The Puget Sound Fir (A. grandis).—A beautiful and stately tree of over 200 feet high, with dark green cones 2 to 3 inches long, and dark shining leaves, white below. Hardy and free in various parts of Britain; best in moist soils, trees in Scotland at Ochertyre being over 60 feet high in 1899. N.W. America.

The Columbia Fir (A. nobilis).—A mountain tree, 200 to 300 feet high, with deep glaucous foliage and brown cones 5 to 7 inches long. Hardy and rapid grower in Britain. Oregon.

The Crimean Fir (A. Nordmanniana).—A beautiful dark green tree, with rigid branches and dense dark green foliage and large cones. Hardy and good grower in Britain. Caucasus and Crimea.

The Red Cedar (Juniperus virginiana).—A graceful, hardy tree on the hills and mountains of N.E. America, giving somewhat of the effect of the Eastern Cypress in Italy, and in our islands a good sheltering tree in the poorest of soils and rocky places.

The Hemlock Spruce (Tsuga canadensis).—A tree sometimes over 100 feet high with a diameter of 4 feet in the trunk, inhabiting cold northern regions from Nova Scotia to Minnesota. This tree has been much planted in England, but it has not so far seemed to attain the stature and form that it shows in Canada. It is of too high a character among the nobler northern trees to be left out in any varied planting of evergreen forest trees, choosing for it cool soils or river banks.

The Western Hemlock Spruce (T. Mertensiana).—A noble tree of fine habit, a larger tree than the Canadian Hemlock Spruce—sometimes 200 feet high, with a trunk diameter of 10 to 12 feet. A native of Puget Sound, British Columbia to Alaska, and coming from such fog-moistened region hardy enough for our island climate. The foliage, as graceful as a fern, is of a lustrous green, and silvery white beneath.

Much has been spent and wasted in planting these, owing to the excitement over the Wellingtonia and other Pacific coast trees. For these, people almost ceased to plant the best native trees and the really good *Useless Evergreen Trees.* Pines for our land, the main result in many cases, except in the most favoured places, being ugly sticks often half dead. The effect, also, is so ugly in what is called the "Pinetum" that people might well be tired of planting conifers. But the true "Pinetum" is the Pine wood, where no tree should ever enter which is not as hardy as the Scotch Fir or the Yew.

The Deodar Cedar is unfit for the woodlands of our country, being tender. The Redwood of California, which is a fine tree in its own country and grows pretty well with us, is injured almost every year even in southern parts of England, though it may thrive as a close wood. The Wellingtonia is worthless from a forest or other point of view in this country. Araucarias should never be planted in any woodland work, nor should any merely curious conifer, and many absurdities are described in catalogues serving to obscure the value of the really noble Pines.

Design.—It is important to get out of our heads skimpy ideas of planting, wrong in effect for shelter, timber, and simplicity of working. North or south, east or west, we often see that, if any planting of evergreen trees is done at all, it is done in narrow skirtings to roads, so that the winds cut through the line in an instant, whereas when trees are massed rightly, the edge of the wood impedes the prevailing wind, and within fifty yards the trees are in shelter and warmth. The best way to plant is to take a piece of ground which is not valuable for arable or any other use, break it up, and plant it as wood. If, as often occurs, there are few or no evergreen trees among the hardwood trees of the place, it is all the better if we can place an evergreen wood in the midst of Oak and like woods; birds can get more protection in such woods, as in estates with hard woods only it is too easy for the poacher to see the pheasants clear against the sky on the leafless trees. All planting of these trees should be in masses, bold groups or "clouds" on the hills. It is not a question of space; an acre or two rightly planted would be better than miles of the mean skirtings to roads called "plantations," and the round clumps with which so many country places are spotted and disfigured.

(To be continued.)

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NEW NARCISSI.—At Birmingham, on 16th and 17th of April, were some very beautiful new seedlings from Engleheart, Miss Willmott, and MM. Barr, De Graaf, Pope, Walton, and others. The variety in form, size, and colour is very great, but many of the new fiery cupped and saucered star-flowered and Poet's seedlings droop their heads and would not show themselves much superior to existing kinds on the grass. Another weak point in the

red-cups is they will not withstand sunshine, the fiery cups shrivelling under it like the end of a cigar. The Daffodils, such as Royal, King Arthur, King's Norton, Queen Christina, Phil May, Hatfield Beauty, Cleopatra, Mrs. George Barrand Loveliness, both fine white Daffodils, and Francesca, Ellen Willmott, Hodsock's Pride, Van Waveren's Giant, and Weardale Perfection, are all very fine and bold things, but dear at present.—F. W. B.

GERANIUM.*

It is not proposed to give anything like a monograph of the large genus *Geranium*, which is spread over the temperate regions of the whole globe, but to note a few of the best of those which the writer cultivates in his garden in Cheshire, without giving a botanical description of any, for which the reader is referred to works on botany.

Three or four years ago I saw in the flower garden at Warley a beautiful hardy *Geranium* a foot high, with large blue flowers, called there *G. grandiflorum*. It had been raised by Herr Max Leichtlin from seed collected in Sikkim; he adopted this name for it, and sent a plant and seed of it to Miss Willmott, who gave me seedlings. It bears seed freely, and the seedlings flower the second year; some I raised have come quite true, and are a valuable acquisition. The accompanying coloured plate is a very good likeness, and tells more to amateurs than a detailed description of botanical characters would do; but whether it has a right to the name of *G. grandiflorum* (Edgeworth) is doubtful. This name is found given in Sir J. Hooker's "Flora of British India" as a synonym of *G. palustre* (Lin.), though that authority tells us that the identity is doubtful. "Index Kewensis" also refers *G. grandiflorum* (Edgeworth) to *G. palustre* (Lin.), a plant found in several parts of Europe, of which I have never seen a living specimen; but from its portrait in Sweet's "Monograph of the Genus *Geranium*" it must be very inferior to the plant here figured. The name *G. grandiflorum* does not appear in the latest edition of the Kew hand-list of hardy plants, though *G. palustre* does; but I have heard that botanists at Kew think that the subject of our plate may be a Himalayan variety of *G. pratense*, though that occurs in the Himalayas in its typical form. Gardeners will not be content to wait till these doubts are settled before obtaining for their gardens this beautiful plant, which will soon be in all nursery catalogues. Meanwhile *G. grandiflorum* is a good provisional name, which the flower well deserves. *G. pratense*, a native which we all know, varies much in merit according to soil and situation. In the dry gravel of the lower Thames Valley and by the sides of the Kennet, masses of it make a fine show in June and July; and on the banks of the river Weaver in Cheshire, close to the smoky town of Northwich, and within a very short distance of huge alkali works, it displays flowers of a brighter blue than I ever saw them elsewhere, but whenever I plant it in my garden the growth is succulent and coarse and the colour of the flowers pale and washy; and, though I retain the double form for the abundance and long season of its flowers, I cannot call these of a good shade.

The few *Geraniums* described below are intended to be in order of merit as garden ornaments. Next to *G. grandiflorum* I place *G. ibericum*, often sold

* With coloured plate of *Geranium grandiflorum* from drawing made at Long Ditton Nurseries, Surrey.



Geranium macrorrhizum L.

as *G. platypetalum*. The flowers are deep blue and large, and when the decumbent stems hang over stones on the edge of a raised border the effect is good. The leaves become beautifully coloured in autumn. It thrives in any soil, doing well in partial shade, and should be allowed to trail unrestrained, as should all other Geraniums. *G. gymnocaulon* (that is, bare stalked) is considered a variety of this species, but is a distinct form, having smaller and flatter leaves with more rounded lobes, and a more compact and low growth. There may be intermediate forms which I have not seen. In De Condolle's "Prodromus" this is made a species.

G. Wallichianum, from the Himalayas, comes very near the last in merit, and at its best may perhaps be preferred to it. The conditions essential to its successful cultivation are a perfectly drained site, a cool, moist soil, and moderate shade. I have sometimes been told by gardeners who have to deal with sandy soils that it is not worth its room, and it is true that in dry, hot, and gravelly gardens, such as many in the lower Thames Valley, it never does well; the colour of the flowers, which ought to be as blue as those of *Nemophila insignis*, degenerates to dull red, and the growth becomes stunted and shabby. In Sweet's "Monograph," tab. 90, and *Botanical Magazine*, tab. 2377, the type is represented with dingy red flowers, but in gardens these shades ought not to be tolerated. On a well-drained rocky bank, facing east or south and partly shaded, a well-selected plant is a first-rate ornament covering a wide space—the flowers growing gradually of a purer blue during August and September as the nights become cooler and the days shorter. Selection is of the greatest importance in this species and should be continued in every generation of seedlings, which should be potted till their first flower appears, and the inferior shades rejected. In this way a good strain will be insured, and the best, when planted out in suitable surroundings, will flower for four or five seasons without further attention. This, like most other hardy Geraniums, ripens seed plentifully. High winds derange the long prostrate stalks, and should be avoided.

For those who can, like the writer, admire flowers of rich crimson, *G. armenum* will be welcome as a sure ornament through July and August. This species prefers hot sun, and is not at all exacting as to soil. The flowers are abundant and of large size, and their conspicuous gaiety is generally approved. It increases readily, either by division or self-sown seeds, which it shoots out to a considerable distance, and the seedlings are easily transplanted. Most Geraniums like a rocky slope, partly shaded, and having deep crevices amongst the stones: the soil of edge garden is not good for them, being too retentive and heavy. Such conditions are especially bad for *G. sanguineum* and its white variety. Beautiful as the type is when hanging down from clefts of the rocks on Great Orme's Head, where it grows wild in profusion, it becomes a troublesome weed

on an edge rockery, and very difficult to eradicate; but it has a near ally named *G. lancastriense*, said to be a variety of it. It seems to be found wild nowhere but in Walney Island off Furness in Lancashire, and is entirely different from the type, both in colour and habit. It does not run underground or root deeply, but spreads moderately, and is easily restrained, growing close on the surface. The pale pink flowers are quite as large as those of the type, and I consider it an excellent rockery plant. It seems to come quite true from seed, and, from a gardener's point of view, it is a separate species. I have never seen a white variety of it or any intermediate form.

G. silvaticum, a rare native with pale purple or bluish flowers—rarely white—and an erect bushy habit, is a fairly good shrubby plant. There is said to be a double variety, but what I have seen for this seems identical with the double *G. pratense*. For dry shady corners where not much else will grow, the dusky *G. phæum* may find a place, the flowers vary from nearly black to dark brown. The seedlings must be weeded round it, or it soon forms a little forest too dense to flower. *G. Endressi* has flowers of a gay pink, which it produces for at least three months. It is not out of place on a rockery, creeping close amongst the stones almost like ivy; but in such a position it requires to be confined within limits. It is a useful plant, not becoming shabby at any time or place, and, as it roots as it runs, it is very easily managed. It does well amongst stones in a semi-wild place. Similar in leaf but having a dark spot in the middle, and not running, though multiplying freely from self-sown seed, *G. striatum* may be mentioned, suitable for any dry corner. The flowers, small for the size of the plant, are nearly white, beautifully veined with dark purple. This and the last mentioned are the only two which I think cross in gardens, for, much as their types differ, I have found plants amongst them which belonged to neither, but seemed intermediate in character.

G. macrorhizon, sometimes offered as *G. balkanum*, has large radical tufts of deeply lobed leaves with a rather disagreeable odour. It spreads rapidly by means of close lateral tufts. The flowers grow on twin stems, each branch having a terminal bunch of four or five flowers of red purple; the petals are veined with lighter stripes. The cultivation requires no instructions. I omit to mention several other kinds of very moderate merit which I grow or have grown in the mixed borders, but three rockery species must be mentioned, *G. argenteum*, *G. cinereum*, and *G. subcaulescens*. The first is one of the choicest of alpine and deserves the best place that can be given to it, amongst the upper ledges of the stone heap, where there is plenty of rock and little soil. It grows only a few inches high with shining silvery leaves, and forms a compact stemless tuft covered with flowers, large for its size, with veined petals varying from pink to white. In a suitable place a plant will live for several years, but can only be renewed by seed, for which the birds are eager competitors. Often a seed flies into a little crevice

of rock in which a plant could not be inserted, and makes a very neat and interesting ornament. *G. cinereum* is of rather larger growth with ash-coloured foliage, as the name implies. There is very little difference in general appearance between this and the last, but the leaves are without the shining, silvery, and silky gloss. Many of the seedlings of *G. argenteum* seem to pass into *G. cinereum*, but the converse does not hold good. *G. subcaulescens*, with a more eastern range than the other two, being natives of Greece, is rather a taller and more robust plant, rising with a short stem. The leaves are green and the flowers dark purple. Though equally rare, it is generally thought less choice than the others, with which it is closely allied. Two more must be mentioned, both of biennial habit, and sowing themselves as weeds all over the garden. *G. Robertianum*, of which I have two white forms, one with the anthers pink, and in leaf and habit like the type, the other with the flowers uniform white, and more compact in habit, with pale green leaves. These have preserved their distinct characters all over the garden for twenty years, and the type though common in the surrounding woods and lanes never comes into the garden. The last I name is *G. lucidum*, which is not wild in the neighbourhood, but grows all over the walls, ornamenting them with its glossy green leaves in winter, some of which turn bright scarlet before the plant dies.

Edge Hall, Malpas.

C. WOLLEY DOD.

GOVERNMENT NEGLECT OF FORESTRY.

THE Royal Commission on Forestry has, like most Royal Commissions, resulted in little or nothing beyond issuing a feeble report of their feeble resolutions. In France and Germany forestry is a living thing, of great importance to country folk and of high value to the State. Forests planted on poor hills and moors, useless for cultivation, add great beauty to the country and return a good revenue to the State. There is no such organisation here, though the opportunities for planting in Wales and Ireland and many poor lands in England are as good as any on the continent. Where a few private individuals have planted in Ireland and Scotland the results are extraordinary; the most hopeless bog and mountain producing very fine timber.

The Pembrokeshire County Council at a recent meeting unanimously resolved to communicate with the other county councils of the Principality, suggesting a conference to discuss the desirability of establishing a school of forestry for the whole of Wales. Mr. Edward Robinson, of Boncath, in proposing the resolution, referred to the report of the departmental committee on the subject as disappointing, the scheme recommended being, he declared, neither bold nor comprehensive. The Government had hitherto held that public bodies

must step into the breach and supply the long-felt want, and, although a school of forestry was held to be essential for India, had refused to establish such a school in this country. Nearly every State in Europe had its school of forestry, but in this country the question was neglected, and millions of money were consequently lost. Assuming there were in the Principality a million acres of waste land, which was a low estimate, this, by judicious planting and cultivation, should at the end of thirty years be worth £25,000,000 to £30,000,000. Their waste lands could be made to furnish the whole supply of pitwood to the South Wales collieries, which now took from 750,000 to 1,000,000 tons, worth nearly £1,000,000, annually from abroad, but chiefly from France, where the plantations in the province of Landes had been created since 1860, and were now worth over £30,000,000. We paid about £25,000,000 annually to foreign countries for timber, and he contended that if the waste lands of the United Kingdom were properly afforested a saving could be effected of £6,000,000 per annum. That it paid to grow timber was beyond dispute. The company he represented lately purchased in the neighbourhood of Narberth, in their own county, ten acres of land of forty-five years' growth, at £100

per acre, which gave practically £2 5s. per acre per annum for land which, from an agricultural point of view, would not have been worth 5s. per acre. The Chairman (Sir Charles Philipps) said that few more practical resolutions had been brought before the council. Of his own experience he knew that a large portion of the land in Wales, and particularly in Pembrokeshire, was only suited for tree cultivation.

Proposals.—This is an instance among many of what is lost to the country owing to the apathy of our Government. The real trouble is that it does nothing at all to help forestry, such as is done in other countries. In France anyone who plants is exempted from taxes for a number of years until the wood has some value—a very wise encouragement on the part of the State. In this country even the Government's own waste lands are neglected, and very often left bare as a desert; but in France and Germany the woodland country, not only the State's own but everybody's woods, are considered an interest of the State. People say—and it looks like truth—that Royal Commissions are only an excuse for doing nothing; but look at the dreadful waste of time and the expense of the mountain giving birth to its mouse!

The Commission recommends the establishment of professorships at Oxford and Cambridge—places already overdone with professors. As the only place yet discovered for the training of good sailors is the sea, so the forest is the best school we can ever find for foresters. There are large areas in our country, like the New Forest, which might well be chosen for this purpose, and, failing these, wooded districts like those that occur in certain parts of Sussex, Hampshire, and Buckinghamshire would be far better for a forest school than any town. To place a college for teaching forestry in a city like Nancy, with its pokey botanic garden of labelled trees, may have its uses, but is not the best way. A forest school should be within sound of the music of the Pines. We doubt the utility of a university for teaching forest planting. In every country the best results in forests are got from native trees or trees from near regions. To get good growth from native trees we are no more in want of college exhortations than the waves on the shore. There must be the will to plant and protect the little trees, and, given this, it is not easy to stop their growth. One of the most remarkable things about a forest in fertile countries like our islands is the astonishing growth after the first few years' start.

Wales and Ireland.—The report favours the establishment of teaching centres in England and Scotland, whilst ignoring the claims of Ireland and Wales. Many parts of England and Scotland are bare enough of forest, but Ireland and Wales are

worse off. If we climb up on Cader Idris, we may see through, perhaps, a rift in the clouds the hills stretching back one after the other in the dim distance, treeless as the backs of great mammoths. In Ireland, whether we look over the Bog of Allan or on the hills from the Galtees to the Mourne Mountains, it is the same desolate surface. Should we ever have a forest organisation in the feeblest degree resembling that which obtains in other countries, there ought to be a forest officer for such important regions as Ireland and Wales, as probably no wealth that these countries now possess would be greater than that which would result from good planting of all the waste and inferior land.

Beauty from planting.—It would be too much to expect these Royal Commissioners to enter into this aspect of the question, yet it is important to consider it, apart from other good reasons. The flow of visitors from our colonies and from other countries should make the beauty of these islands a very important consideration for us. The natural landscape is so good that the absence of woods on the barer and higher moorland and mountain ground is a serious blemish. One of the things that has struck us most is the good effects that result in Germany and Austria from the cresting of the high hills and poor ground with evergreen woods. The same plan would add enormously to the landscape and sylvan beauty of our country, and this without lessening in any way the value of the timber crop. We have also to think of all the beneficent results in warmth and shelter and the holding of springs and rains that result from good planting. Living in a cold, cheerless climate of some months of winter, the shelter of the evergreen woods is so much the more precious to us.

Counties' Interest in the Work.—May we suggest the good that the now organised county councils might do in this way? Why, in counties like Hampshire, Surrey, and Sussex, abounding in heaths and moors, should not the councils plant a portion of these as an example, choosing in each case the best trees for the soil—Pines on Surrey heaths, Oaks in the weald, and Beech on the chalk; it would be an object-lesson and cost them nothing for the land and little for the care beyond that involved in the exclusion for a time of browsing animals. As some counties and many districts often have peculiarities of soil, the best way to illustrate their successful planting would be by practical essays in each place. A little money spent in that way would, we think, be much more effective than lectures on the subject.

As a contrast to our Government's apathy, we print the following circular (No. 21) of the Forestry Division of the United States Department of Agriculture. In it will be seen a commonsense way of doing some good to forest lands, even more effec-

tual than the French plan of freeing timber land from taxation until it has begun to be profitable :— Circular No. 21.

UNITED STATES DEPARTMENT OF AGRICULTURE.

Division of Forestry.

PRACTICAL ASSISTANCE TO FARMERS, LUMBERMEN, AND OTHERS IN MANAGING FOREST LANDS.

The forest lands of the United States are owned in three separate ways : First, by the Government of the United States, to which belong the reserved and unreserved forests of the public land States ; second, by some of the States ; and, third, by private owners, among whom are individual men, companies, and institutions.

The private forest lands exceed in area those of the United States and the Federal Governments combined, and their preservation in productive condition, as regards both timber and water supply, is of vast importance to the nation. As a rule, however, the treatment they receive is calculated to destroy their value rather than to sustain or increase it. The reason is evident and natural. These lands, like other private property, are held by their owners for the returns they yield, and the owners as yet have scarcely begun to understand that it pays better, as a rule, to protect a forest in harvesting the timber crop than to destroy it. A knowledge of how to bring about this desirable result is still more restricted, while trained men capable of advising forest owners in the matter are very few indeed.

Examples of Improved Methods.—For these reasons the Division of Forestry has undertaken to provide a series of examples of improved treatment of private forest lands, in which the present interest of the owner and the protection and improvement of the forest shall have equal weight. The object of the present undertaking is to show that improved ways of managing timber lands are best for the owner as well as for the forest, by assisting a few owners to make trial of them, and then publishing the results for the benefit of all.

Government Co-operation with Forest Owners.—Forest lands in private ownership are mainly of two kinds—small holdings, for the most part farmers' wood lots, and larger areas, chiefly valuable for timber. This Division is prepared, so far as its appropriation will permit, to lend its aid to the owners of each kind, on receipt of applications stating the situation, area, and character of the forests for which working plans are desired. Applications will be considered in the order in which they are received, but precedence may be given to the lands most likely to furnish useful examples. A working plan once prepared will not be put in effect unless it is satisfactory to the Division of Forestry and to the owner. The conditions upon which the Division will under-

take necessary investigations and give assistance are stated in the two following agreements. Tracts of any size, from five acres up, are eligible. The only distinction made is that the owners of large tracts, which may present more difficult questions, will be required to share in the expense of solving them, while owners of small tracts will receive assistance from the Division without bearing any part of the cost.

Wood Lots.—Throughout a very large portion of the United States every farm has a certain part of its area under wood, either planted, as in regions otherwise treeless, or of natural growth. The value of this wooded portion, besides protection from the wind, is chiefly for fuel, fencing, and railroad ties, with some building material and the wood needed for uses about the farm. Without the wood lot a farm very often would be an unprofitable investment, because the farmer could not afford to buy the wood which now costs him very little except labour. Indeed, in very many cases, the wood lot keeps the farmer going. His labour there during the winter, when otherwise he would be idle, makes up for any deficit in the cultivated land, and the ready money he receives from the sale of fuel, ties, or other material, is indispensable to his comfort and prosperity. In two directions, then, material and money, the product of his wood lot is of high importance to the farmer. But in the majority of cases this part of the farm is far less useful than it might easily be made. This is true because the farmer does not study its productive capacity as he does that of his fields and pastures, and hence does not make it yield as freely as he might, with little additional labour, if he went about it in the right way.

The following memorandum agreement gives the terms on which the owners of small tracts of forest may co-operate with the Division :—

WOOD LOT AGREEMENT.

Washington, D.C., September 1, 1898.

The Department of Agriculture of the United States and John Doe of Doeville, County of Bell, State of Pennsylvania, mutually agree together as follows :

1. *The Department of Agriculture, in pursuance of investigations in forestry, and in order to disseminate a knowledge of improved ways of handling forest lands, shall, after personal study on the ground by its agent or agents, prepare a plan for harvesting the forest crop and reproducing the forest on the land of the said John Doe situated and described as follows: 100 acres, more or less, of second-growth hardwood forest land, in the town of Doeville, County of Pike, State of Pennsylvania, on the farm known commonly as the Old Doe Place, and in the north-west portion of the same.*

2. *The said plan shall be prepared for the purpose of promoting and increasing the present value and use-*

fulness of the said land to its owner, and to perpetuate and improve the forest upon it.

3. Upon the completion of the said plan, and its acceptance by the said John Doe, the Department of Agriculture shall supervise the execution thereof so far as may be necessary.

4. The Department of Agriculture shall render all services under this agreement wholly without charge to the said John Doe, nor shall it participate in any degree in the receipts and expenses arising from the said land, except to defray the pay and expenses of its agent or agents.

5. The Department of Agriculture shall have the right to publish and distribute the said plan and its results for the information of farmers and others whom it may concern.

6. This agreement may be dissolved by either party upon ten days' notice given to the other.

(Signed).....

(Signed).....

Washington, D.C., October 1, 1898.

The working plan above mentioned being now completed is accepted, and will be carried out under the conditions and during the validity of the above agreement.

(Signed).....

Timber Lands.—Large bodies of forest land in almost every wooded portion of this country have come into the hands of private owners, and are held by them chiefly for their value as sources of timber. Much of this land, probably the greater part of it, is in hilly or mountainous regions, where the preservation of the forest is of importance for both wood and water, while the destruction of the lowland forests, except when they give way to agriculture, would bring with it the loss of a plentiful spring of national wealth.

OVERDOING.—It should be a cardinal rule in landscape art (as in all other art, I think) not to multiply means for producing a given effect. Where one stroke of the brush is enough, two evidence weakness, three incompetency. If a clump of half-a-dozen trees will effect the needful diversion of the eye, and produce the desired shade, any additions are worse than needless. If some old lichened rock upon your lawn is grateful to the view, do not weaken the effect by multiplying rocks. A single outlying boulder will often illustrate by contrast the smoothness of a lawn better than a ponderous mass. A single spiral tree in a copse will be enough to bring out all the beauty of many round-topped ones. Because some simple rustic gate has a charming effect at one point of your grounds, do not for that reason repeat it in another. Because the Virginia creeper makes a beautiful autumn show, clambering into the tops of one of your cedars with its crimson leaves, do not therefore plant it at the foot of all your cedars.—D. G. MITCHELL.

The harvest of the timber crop on these private timber lands is commonly accompanied, under the usual methods, by the destruction of the forest when saleable trees predominate, and in any case by needless injury. Fire follows the lumberman, in spite of the precautions he very often takes, until in many places it is thought to be inevitable. These are misfortunes from which the owners of the forest land are the first but not the only losers, for in the aggregate the loss is a public one. It is to prevent these public and private losses that the Division offers its assistance, realising fully that they must continue until the success of some of their number proves to the great mass of timberland owners that improved and conservative methods of lumbering will pay.

A specimen memorandum agreement, such as this Division, through the Department of Agriculture, is prepared to make with owners of timber land, so far as its resources will permit, is appended. Second growth and partly devastated lands will be considered as well as virgin forest.

[Here follows a similar agreement to that above, but for owners of larger areas.]

Applications.—Applicants for working plans should state which agreement, wood lot or timber land, they have in mind. They are requested to specify the acreage and situation of their land, the latter by State, county, and township, or by public surveys. Full details as to the character of the forest are especially desired, in order to avoid delay. Applications may be made at any time.—GIFFORD PINCHOT, Forester.

Approved: JAMES WILSON, Secretary of Agriculture, Washington, D. C., Oct. 8, 1898.

VEGETATION ON STONE WALLS IN ENGLAND.—If the roadside happens to have no hedge, the ugliest stone-fence (such as, in America, would keep itself bare till the end of time) is sure to be covered with the small handiwork of Nature; that careful mother lets nothing go naked there, and, if she cannot provide clothing, gives at least embroidery. No sooner is the stone-fence built than she adopts and adorns it as a part of her original plan. A little sprig of ivy may be seen creeping up the side of the low wall and clinging fast with its many feet to the rough surface; a tuft of grass roots itself between two of the stones, where a pinch or two of wayside dust has been moistened into nutritious soil for it: a small bunch grows in another crevice; a deep, soft verdant moss spreads itself along the top and over all the available inequalities of the fence; and where nothing else will grow, lichens stick tenaciously to the bare stones and variegate the monotonous grey with hues of yellow and red.—HAWTHORNE.

THE GREATER TREES OF THE NORTHERN FOREST.

THE WHITE (OR DUTCH) POPLAR (*Populus alba*).

FOR many years in England the vogue for coniferous trees has thrown the planting of summer-leaving trees into the background, and among the trees that have suffered most from this neglect is this noble Poplar, which one so seldom sees put to good use either on woodland or in picturesque planting. Here and there, in getting down from the hills in Kent or in Wiltshire, and going near an old house or village, we see it, perhaps, rising with a splendid dignity from the rich hollows and ask if any tree of our country is more beautiful or stately. When we do see it, it is too often solitary, whereas the tree is seen to best effect as a small or large group. In our country, in hollows and sheltered places, there is no tree that could be used to better effect, and that even in places too moist or unsuitable for other trees. Rabbits are very destructive to young trees, and in a plantation we have made of it many tall young trees are all gnawed round and snap off at the base, so that when planting the White Poplar in places where rabbits abound it should certainly be wired for six or seven years.

Our illustration is engraved from a picture which was shown in the Paris Salon a few years ago, and well shows how the fine form of the tree appeals to the artist, and in every state the fine grace of the tree is very clear to those who care for tree form. Even poor specimens in suburban gardens show that, even more, perhaps, in winter than in summer.

This fine tree has an additional claim upon us in that it is a native of our own country as well as central and western Europe, and therefore there can be no doubt about its fitness for our climate. Our own opinion is that it is very rarely that an introduced tree is as good as a native tree either for effect or for any other purpose. Those who undervalue the wood of the White Poplar in our country should know that it is said by Mathieu (*Flore Forestière*) to be very much more valuable the further south we go, and that the wood in the north is too soft and has various other defects.

It is much more cultivated in Holland, Flanders, and near regions than in our country, and hence, we suppose, the name of "Dutch" Poplar. This has led us to go to a source in that country for our description of the tree, and in a paper written by M. N. L. Crahay, in the "Bullétin de la Société Central Forestière de Belgique" we find a good account of it from a forest point of view:—

"The White Poplar is a valuable tree in many ways, and, we think, it deserves a more important place in forestry than it has yet received. It is a tall, handsome tree, straight in the stem, dignified, and, in conditions that suit it, may grow 100 to 120 feet high and measure 10 to 13 feet round. The



THE WHITE POPLAR.

(Engraved for FLORA from a picture by a Dutch artist, shown at the Paris Salon, now in the possession of Mrs. Spencer Chadwick.)

main stem is free of branches, an important advantage. Although the seeds are common, fertile seeds are not so easy to obtain ; and, although we have visited many woods containing White Poplars, we never yet met with one that had been replanted by natural sowing, which is probably owing to our country being situated towards the northern limit of the tree's range.

"There is a divergency of opinion among authors in regard to the natural distribution of the White Poplar. According to Mouillefert it includes England, Denmark, the south of Sweden up to 61 degrees latitude, and Russia up to 55 degrees, including the Siberian Urals. On the other hand, it is considered by Hempel and Wilhelm not to be indigenous except to the southern half of Europe and the East. The Rhine plain, the upper and middle Danube, and the Hungarian plain, form, according to these authorities, the northern limits of the tree's range. It is essentially a tree of the south, and, though enduring well the cold of our hardest winters, only attains to its best dimensions in cool temperate climates, notably in the valley of the Danube. It loves valleys and moist plains, and on the mountains of even southern Europe is never seen at a higher altitude than 2,000 to 3,000 feet.

"The White Poplar is exacting in regard to soil, which, to suit it, should be deep and moist. It loves best alluvial soils, the neighbourhood of waterways, and the bottoms of slopes. It will not grow well in marsh soils that have been drained, and in sandy, dry, or poor soils it is ill at ease and stunted in its growth.

"Given favourable conditions, the growth of the White Poplar is rapid and sustained. Its life extends over several centuries. A forty-year-old tree may measure 5 to 6½ feet round the stem, and 80 to 100 feet high. In 1886 or 1887 we planted some trees in a valley ; eleven years after many of these trees measured between 27 and 28 inches round the stem at a height of 5 feet 8 inches. The forest of Soignés and the wood of la Cambre contain numbers of White Poplars measuring 8 feet and more round the stems and 110 to 120 feet high. Mathieu, in his *Flore Forestière*, gives an instance of a White Poplar growing at St. Julien, near Troyes, which measured about 100 feet high and 24 feet round at 4½ feet from the ground, and was still in full vigour.

"The White Poplar loves the light and suffers if overshadowed by other trees. It likes to have its head free ; so the culture that suits it best is over underwood. Set in young cuttings as a long-stemmed plant it rises quickly above the underwood and soon outgrows most other trees in the plantation. The tops of fine grown trees are seen from afar, and seem proud of their strength and lofty stature. Thanks to this quickness of growth and to a full, if somewhat light, foliage, the White Poplar does not oppress the underwood, and for this reason it is one of the most valuable trees for wood-land.

"The root system begins with a tap root, and after some years numerous long roots are developed. They are much on the surface, and readily give out suckers.

In the neighbourhood of a tree that has been cut down the entire surface, to a distance of 65 or 80 feet is covered with a nursery of suckers. A fact that should be borne in mind is that the White Poplar dreads the wind, and therefore we should avoid planting it in isolated lines or as a margin of trees, or on a south-east slope. There is the greater reason for giving it a good place in hollows, at the bottoms of slopes, and within woods where underwood is grown, where it can develop to the full its fine and erect habit. In parks, with its rapid growth, majestic port, and silvery foliage, it plays an important part. This may be seen if in the spring one surveys the masses of great trees from the grassy slopes above the lake in the Bois du Cambre.

“Timber.—The wood of the White Poplar is much valued. The grain is fine and lustrous, and the annual markings very regular. The heart-wood is yellowish-white and the perfect wood light red in colour, light and durable. It is the most enduring of all white woods, and is much sought after for all kinds of construction and cabinet work, carriage and boat building; as a fuel it has only a middling value. Owing to its various forms of usefulness the timber fetches a good price.

“Attempts to propagate the White Poplar from seed seldom succeed, and only by layering is there any chance of success. When good seed is to be had it is advisable to mix it with damp sand immediately after collecting and then lightly cover it over. The seedling plant is unknown in nurseries, the tree being propagated by cuttings and suckers. Cuttings, however, take badly, and of all the Poplars this and the Aspen are the worst to increase in this way. The easiest mode of increase is by suckers. Choose the best plants, lift with a small portion of the root, and transplant to the nursery. The plants readily take root, and the practice is to cut them down at the end of a year. Of the new shoots that arise with great vigour only one is kept and grown for two or three years. This method of propagation being intended to produce plants identical with the parent tree, it is important to take them from the best trees.”

NEW FRUITS IN AMERICA.

NEW fruits still continue to multiply in this country; but while varieties increase, quality is not always an accompaniment of novelty.

Apples.—The Western States in particular have been prolific of new apples, some of which are not without their merits in the regions of their origin, even if they do not find equal favour in the great garden of the Genesee Valley of New York.

The past decade has produced no new variety of the fruit that tempted Eve to compare with that apple of apples, Northern Spy, which was raised and disseminated at Rochester, as well as the Spitzenberg, Jonathan, Mother, Snow, and Newtown Pippin. Nor does any new apple equal in beauty of colour

and form the magnificent German Red Bietigheimer. To taste the Newtown Pippin in perfection and see its golden beauty, it should come from the Blue Ridge of Virginia, just as the turkey, which Brillat-Savarin pronounced the finest gift of the New World to the Old, attains its supreme excellence in the little state of Rhode Island.

Of new varieties the most striking, perhaps, is the Bismarck, from New Zealand, a handsome, showy sort, as well as a hardy and prolific November apple.

Pears.—Among newer pears of good quality are the following:—Dorset, an attractive, large, golden-yellow, very late-keeping variety, with sweet,

melting, juicy flesh ; Lady Clapp, a large, handsome, yellow, smooth-skinned, vinous sort, of fine quality, succeeding the favourite old Bartlett ; Worden's Seckel, a seedling of that *multum in parvo* the Seckel, perhaps equal in quality to its parent, and exceeding it in size and keeping qualities ; and Gans' Seedling, which precedes the Bartlett and succeeds the Tyson, and which has proved an acquisition to the list of summer pears. Neither should the comparatively new and most excellent autumn variety Frederick Clapp, a fine-grained, lemon-yellow, rich and aromatic sort, be omitted.

Yet who shall say that any of these surpass many of the older sort, such as Urbaniste, with its delicious rose fragrance and flavour ; Beurré Hardy, Beurré Superfin, Duhamel du Monceau, Fred. Baudry, and the delightful Petite Marguerite, Dr. Reeder, and Dana's Hovey ?

Coarse pears, like the Kieffer, with its quince flavour, which are easily grown in the nursery rows, and plums like many of the Japanese sorts, and numerous native hybrids, are raised in abundance, and find a ready market ; as do rank, "foxy" grapes like the Niagara, Lady, and Pocklington. Yet what discriminating palate would compare a Japanese plum to many of the Reine Claudes or Gages, and especially that most luscious old offspring of the Gage, McLaughlin, a variety of American origin.

Plums.—Of plums of recent introduction one may choose among the following, and then be all the more impressed with the virtues of the old :—Abundance and Red June, both of Japanese origin, and not without their qualities ; the Burbank, Giant Prune, Wickson, Chalco, Climax, and Sultan, hybrids of large size, raised by Mr. Luther Burbank, of California.

Peaches.—The Champion, Crosby, Elberta, Greensboro, and Triumph are new peaches worthy of recommendation, notably the Elberta, raised in Georgia. This is a large handsome variety, and an excellent shipping sort. The Champion, also a large attractive variety, is probably the best of the newer sorts in quality. None of the recently-introduced kinds, however, are equal to the favourite old Crauford, Surpasse Melocoton (a Rochester production), Coolidge's Favourite, Old Mixon Free, and many of the white-fleshed kinds, which are now more highly appreciated and more extensively cultivated than formerly. Nectarines are little grown in the United States, being specially subject to the attacks of the curculis. Indeed, a nectarine is nowhere as fine as the glass-grown fruit caught in a net in England.

Grapes.—McPike and Campbell's Early are two novelties in large-berried grapes of considerable value, the former being a seedling of the Worden,

with a fine vinous flavour, and producing both handsome clusters and blackberries of immense size, with a flavour recalling somewhat that of the Black Alicante. Winchell is the earliest white native grape, with the Duchess, Moore's Diamond, and Rebecca to take its place if necessary, so far as quality is concerned. The dark Concord continues to be one of the varieties most largely grown, as also the big foxy Niagara ; while, for choice table use, the various Rogers hybrids, Nos. 4, 14, 19, and 53, or Wilder, Gaertner, Merrimack, and Salem are highly esteemed.

Rochester and Brighton, both products of the City of Flowers, are among the finest of our early red grapes. The Mills, recently introduced by Rochester horticulturists, a cross between the Muscat Hamburg and Creveling, is an entirely distinct variety, which, when properly ripened, has no superior and hardly an equal as a dessert fruit. The berry is large, jet black, and covered with a thick bloom ; the flesh firm and juicy, strongly recalling the flavour of the Muscat type ; the vine vigorous and productive, and the large, compact, shouldered clusters sometimes weigh over twelve ounces.

Blackberries.—Of blackberries the Rathbun, with extra large berries, is a promising new comer. Those who wish a striking novelty, somewhat at the expense of quality, may find it in the Iceberg, a Californian variety producing white berries. Perfection is a new red currant which has not been sufficiently tested as yet to pronounce upon definitely. Red Cross and Wilder are two large-fruited new sorts, very productive and of fine quality. The old Cherry among the reds, and the White Grape among the whites, are still extensively cultivated. Of raspberries, Fastolf, Belle de Fontenay, Herstine, Superlative, and the delicious Brinckle's Orange are considered among the best of foreign varieties and their seedlings. Of American species and varieties, Cuthbert or Queen of the Markets holds the highest place at present. For such as are partial to the seedy Black-cap there is a long list of new kinds to select from, with few as good as the Kansas and the Gregg.

In strawberries, the fine old sorts like Triomphe de Gand and others have been superseded by newer kinds, both good, bad, and indifferent. The McKinley, which made its bow in Rochester, and the Marshall, an improvement on the well-known Sharpless, are among the best of the berry beloved by Dr. Boteler and Linnæus ; while among the newer kinds Gladstone, if not yet pronounced *hors concours*, is regarded as among the most promising.

GEORGE H. ELLWANGER.

Mount Hope Nurseries,
Rochester, N.Y.

THE CAMELLIA AS A HARDY SHRUB.*

THE greenhouse has done us few worse turns than spreading the idea that the Camellia is a tender shrub. Its culture was so common in pots that little thought was given to it out of doors. Yet it is hardier than some of our common ever-green shrubs. The cultivation of the Camellia in pots having gone a little out of use, and as indoors it did not always do well unless the plants were planted out in large houses, we have arrived at this state of things that, in many places, we see it well grown neither indoors nor out. If neglected or forgotten in the house and not seen out of doors we lose the charm of one of the handsomest shrubs of temperate climes, both for the effect of its foliage and its brilliant flowers, yet there are many places over half our country at least where the Camellia can be grown well as a shrub. In some parts of the south, and near the sea generally, success is so marked that the plants grow as freely as Hollies. They would thrive much farther north if they had a fair chance. The old plants on the north wall at Chiswick in the Thames Valley, which have flowered so well for many years, prove how hardy and enduring the shrub is. In all valleys plants suffer more from cold in winter, so that in gardens where there is some diversity of surface, and on the sides of hills, their growth would be safer. A mistake has been made in the adoption of the double to the exclusion of the single kinds, and in the Camellia, especially in its outdoor aspect, we doubt if the double flower is an improvement. In fact, the single Camellias are more beautiful in colour and varied depth of flower surface, and there is no doubt that many beautiful single kinds which would have graced our gardens, have been thrown away in the past in the chase after double varieties. In a cool climate like our own the double flower does not open so well out of doors, and everything points to the superiority of the single Camellia in its pure and decided and varied colours. Hitherto, in planting out, most people have only taken the warmest positions, so that while the wood ripened well, the flower on the other hand was exposed too soon to the deceptions of our early February suns and suffered all the more. In the plants on the north wall at Chiswick we have proof that a northern exposure will often suit perfectly, and those who wish to plant the Camellia should do so in a variety of aspects, and even favour the northern and eastern ones. As to soil, we have known the plant to grow in the coarsest rubbish, and it is not difficult anywhere if we avoid lime.

Sir F. T. Barry has well shown in his garden at St. Leonard's Hill, Windsor, that it is not only in the favoured southern counties that success with the Camellias may be hoped, and in various notes to *The Garden* and other journals has told of his success; he has many plants thriving out of doors in all aspects; they flower beautifully in spring and early summer and even ripen fertile seeds

* With coloured plate from drawing made at Sanders' Nursery, St. Albans.



SINGLE CAMELLIAS

from which plants have been raised. This being so, it should surely be easy for growers in favoured districts to raise and offer stocks of well-grown plants ; failing these, supplies may be looked for where the Camellia is commonly grown as a shrub, as in Italy, Western France, Madeira, and Japan.

In the Isle of Wight, too, and coasts near, the success is most marked, the bushes flowering as profusely as they do in Madeira on the hills, where we have seen fine plantations. At Osborne they do remarkably well ; but of all spirited planters of the Camellia the late Lord Falmouth was the chief. Having confidence in the growth of the Camellia at Tregothnan he collected plants from many sources, with a most interesting and remarkable result. Of these, however, and of other plantations on the south-west we hope Mr. Fitzherbert, who knows them so well, will tell us in a future number of FLORA.

The two fine single kinds herewith figured are the best of various importations from Japan by Mr. Sanders, of St. Albans. He leaves to us the duty of giving them their names, and we do so willingly—calling the light-coloured one *Flora*, and the red *Sylva*.

HARDY FRUITS OF THE LYONS REGION.

(Continued from page 13.)

Abbé Petel.—A gain of the Abbé Petel, of Charantay, Rhône. The fruit is large, attenuated, gourd shape, bent at top. A good, or very good pear. November–December. Tree of medium vigour and fertility.

Agricola.—A gain of M. Mortillet, of Meylan, Isère. A fruit of medium size, richly scented. September. A good standard tree for the orchard.

Alexandre Chomer.—A gain of M. Liabaud, of Lyons. Fair-sized fruit ; in colour bright yellow. A very good pear, but somewhat lacking in aromatic quality. December–January. Tree vigorous and apt for any form.

Aspasie Aucourt.—A gain of M. Rollet, of Villefranche, Rhône. A large-sized pear, greenish in colour, of very good quality, but insufficiently aromatic. Ripens to the fullest extent without becoming unsound. Commencement of August.

Belle de Brignais.—A gain of M. Gaillard, of Brignais, Rhône. Resembles Beurré Clairgeau, but the tree more vigorous. November–December.

Belle d'Ecully.—A gain of M. Cuissard, of Ecully, near Lyon. A very large pear, of good quality, but lacking aroma. September. The tree is fertile, but does not thrive on the Quince.

Belle de Decembre.—A gain of M. Fougère, of St. Priest, Isère. A very large-sized fruit ; for cooking, and remarkable for keeping its aroma after cooking. An excellent dessert fruit also.

Belle Lyonnaise.—A gain of M. Morel, of Lyon-Vaise. A large-sized pear of Quince formation,

red-gilded in colour, of good quality and very aromatic, but rather too brittle. October–November. Tree vigorous and very fertile.

Belle de Mai.—A gain of M. Mortillet, of Meylan, Isère. A large, or very large-sized pear of good, or very good, quality when it ripens, which is only in April–May.

Bergamote Bouvant.—A gain of M. Bouvant, of St. André-de-Corcy, Ain. Of medium size ; in colour greenish-yellow ; of good, or very good, quality for the season, April–May.

Bergamote Jars.—A gain of M. Nérard, of Lyon-Vaise. Round in form, of medium size, orange-yellow in colour ; of very good quality, but with more flavour than delicacy. December–January. Deserves to be cultivated, not only for the good quality of its fruit, but also for the elegance and hardiness of the tree.

Bergamote Liabaud.—Raised by M. Liabaud, of La Croix-Rousse, Lyons. A medium-sized pear of good quality but subject to crack and knot. November–December.

Beurré Luizet.—A gain of M. Luizet, of Ecully. A large-sized pear of fair quality ; succeeds better as an espalier on the Crab. November–December.

Beurré ae Mortillet.—A gain of M. Fougère, of St. Priest, Isère. A large and very pretty pear, of good quality, aromatic, and not apt to over-ripen. August.

Bied-Charpeton.—A gain of M. Morel, of Lyon-Vaise. A medium-sized fruit of very good quality,

but ripening at a season already well provided with excellent fruit. October.

Bon Chrétien Bonnamour.—A gain of M. Guillet, of Chaponost, Rhône. Of large size, pretty, good quality, but as yet imperfectly known. November.

Casimir Royer.—A gain of M. Royer, of Claix, Isère. A medium-sized fruit, light yellow, golden and sometimes red orange on the exposed side. Flesh almost luscious, juicy, acidulate, with an after flavour of almond; of good quality, especially for its time of year. February–March.

Docteur Deportes.—A gain of M. Treyve. A large-sized pear; short, turbinate in form, as broad as high; lemon-yellow colour, gilded, and frequently tinged with vermilion on the exposed side; of good quality, luscious, juicy, acidulate, and aromatic. November–December. The tree is vigorous, hardy, and constantly fertile.

Docteur Gromier.—A gain of M. Morel, of Lyon-Vaise. A medium-sized, turbinate-shaped pear, tawny in colour, russet-stained on the side exposed to the sun. A very good pear, luscious, juicy, acidulate, refreshing. September.

Doyenné Bizet.—A gain of M. Bizet d'Ecully. Large in size, spherical or truncated at both ends; in colour yellow; skin thick but easily detached. Of good quality, with a slight, rather pleasant, musky flavour. It is difficult as regards soil and exposition. March–May. Tree not vigorous but very fertile.

Doyenné Cusin.—A gain of M. Fougère, of St. Priest. A large-sized pear, rounded in form, yellowish-green in colour, stained bronzy-russet, streaked with red on the exposed side. Of good quality, but, so far, imperfectly known.

Doyenné Nérard.—A gain of M. Bonnefoy, of St. Genis Laval, Rhône. Small in size, spherical, bright red on yellow-white ground on the side exposed to the sun. A pear of good quality, half-luscious, but aromatic. Beginning of August. A tree for the orchard, where, grafted on the Crab, it is an early and fertile fruiter.

Ferdinand Gaillard.—A gain of M. Gaillard, of Brignais, Rhône. Of large size and pretty shape; in colour a fine yellow changing to orange on the exposed side. A pear of fair quality but lacking aroma and flavour. November. A tree of remarkable vigour, hardiness, and fertility.

Fondante Août.—A gain of M. Joannon, of St. Cyr au Mont d'Or, Rhône. Of medium size, turbinate in form, tawny colour on yellow ground; of good quality, firm though luscious, juicy, saccharine, aromatic, refreshing. August.

Madame Cuissard.—A gain of M. Cuissard, of Ecully-les-Lyon. A fruit of fair size, deep yellow, of very good quality, delicate, juicy, aromatic. August. A tree of normal vigour and fertility, adapted for small forms.

Mère Perrier.—A gain of M. Perrier, of Sennecey le Grand, Saône-et-Loire. Large or medium sized; pyriform; bronzed red stippled with lighter red in colour; of very good quality, luscious, very saccharine, but aromatic especially. October. Tree of good vigour and fertility.

Notaire Bonnefond.—A gain of M. Rollet, having the form and appearance of Beurré Hardenpont. Delicate, luscious, juicy, and aromatic. December–January.

Professeur Willermoz.—A gain of M. Joannon. A medium-sized fruit of Bon Chrétien shape; in colour citron-yellow washed and stippled tawny; of good, or very good, quality; delicate, juicy, luscious, saccharine, delicately acidulate, and aromatic. September. Tree vigorous and fertile.

Reine de Mai.—A gain of M. Joannon. Of fair size; turbinate; straw colour tinged rose on the exposed side. A good pear for cooking. Lasts till June.

Sabine Vermorel.—A gain of M. Rollet, of Villefranche, Rhône. A good pear, tawny all over; of good quality. December–January.

Senateur Reveil.—A gain of M. Joannon. Of fair size; handsome fruit; in colour yellow, speckled and stained russet; of good quality, delicate, saccharine, juicy, of good flavour, with a certain piquancy which is not disagreeable. Ripens before Bon Chrétien. August. Tree extremely fertile, even on the Crab, as much so as Beurré Clairgeau.

Souvenir Deschamps.—A gain of M. Deschamps, of Cuire-les-Lyon. Very large in size; long, pyriform in shape, rather bumpy; in colour citron-yellow, stippled red; luscious, saccharine, acidulate, aromatic, with a sometimes musky flavour; of good, or very good, quality. End of September. Tree of normal vigour and fertility.

Thiers.—A gain of M. Rollet, of Villefranche, Rhône. Large in size, pyriform; bright yellow in colour, slightly stained with russet; of good quality, very juicy, saccharine, rather winy flavour, but not buttery. January–March.

The list might be prolonged, but my object has been to enumerate only those pears that have been recommended by experienced pear-growers. Some have only wanted the chance to become better known in order to take their place in the first category of "adopted" varieties. Possibly it will be for the more or less near future to make this reparation. In order to estimate the value of the contribution made by the Lyonnaise region to the wealth of the world in fruit there have yet to be considered her contributions in peaches, plums, apricots, cherries, &c. This will be the subject of a future article, in which we shall, perhaps, be permitted to glance at the novelties which our raisers are continuing to produce with an increasing activity.

FRANÇOIS MOREL.

REPTON'S PLEA FOR THE IVY ON TREES.

PREJUDICE against the most beautiful evergreen climber of the northern world is so common that Repton's defence of it is worth reading, and his pleading is full of good sense :—

"Ivy is not only less injurious to trees than it is generally deemed, but that it is often beneficial, and its growth deserves to be encouraged rather than checked, as is too often practised. I have been led to adopt this opinion during the last two or three years, from having observed the timber in some very old parks and woods (as at Stoneleigh Abbey, Warwickshire, Langley in Nottinghamshire, and some others) where the Ivy had not been cut off, and where the timber was in greater perfection than at other places in the same neighbourhoods where the Ivy had been destroyed.

"During the winter of 1808 and 1809, the contrast betwixt the scenery of different places with and without Ivy was so striking, that I was led to collect facts in support of the opinion so opposite to the theory of those who consider Ivy as a destroyer.

"Linnæus affirms that 'Ivy does no injury to buildings,' and his observation respecting Ivy on buildings confirms mine respecting Ivy on trees; that although it may in a few cases be injurious, it is oftener beneficial; and therefore I hope it will not be deemed presumptuous in me to say, after Linnæus, and in his words, that 'it does no injury to' trees. It is a fact, that of trees covered with Ivy there are apparently more sickly than sound ones. But there are many reasons to be assigned for this appearance: First, the Ivy in winter renders the trees more conspicuous, and few people who see dead branches proceeding from such trees examine whether there may not be other trees near them equally decayed. Secondly, because a decaying or even a dead tree often serves to support Ivy, it is too often hastily supposed that Ivy is the cause of its death or decay. And thirdly, it is the property of Ivy to attach itself to decaying trees in preference to the more healthy ones; and as such trees are of less value, they are often left after their neighbours have been cut down and sold. This will alone account for the comparative difference in the number of sound and unsound trees supporting Ivy. But if a single instance be produced of a healthy tree covered with Ivy near another tree not so healthy without Ivy, this alone would lead us to pause before we cut the Ivy from the tree, 'lest,' as Evelyn asserts, 'the tree may be killed by the sudden exposure to unaccustomed cold.' Instead of a single instance, I could transcribe from my minutes examples of every kind of tree compared with others of the same kind near it, and could confirm my facts by sketches taken in various parts of the kingdom; but I shall only

subjoin a few specimens of such facts as have induced me to take up an opinion on the subject.

"**Facts.**—No. 1. At Twickenham Park are two rows of very large Cedars; two are profusely covered with Ivy, and a nurseryman proposed cutting its roots to preserve the trees, till I showed him that these two were the largest trees and that the Ivy seemed coëval with the Cedars themselves, which they had not in the least injured. No. 2. At Blickling, in Norfolk, are two very large Fir trees; the biggest is covered with Ivy, the other is a bare pole and not so large, though evidently of the same date, and both equally healthy. But the gardener could not be convinced, and only replied by an answer often made, viz., that the tree might perhaps have been still larger if it had not been loaded with Ivy. No. 3. The trees on Lord Hardwicke's estate at Wimpole furnish very striking effects of Ivy; in the pleasure ground east of the house the Ivy trees in the grove are most decidedly the tallest, largest, and most healthy. No. 4. A large Ash very near the road in Arrington is a curious example of prejudice; it is a forked tree, one half naked, the other has been loaded with Ivy; the naked side shows symptoms of decay, the other is quite healthy; but with an idea (I suppose) of saving the tree, the Ivy has been recently cut off, and was hanging in vast masses, with stems of great bulk loosened from the tree without leaving any indenture in the bark of the tree. No. 5. At Stoneleigh Abbey the timber is generally of prodigious size, some Oaks measuring 20 feet round at 5 feet from the ground; many are richly covered with Ivy; but I could not perceive any difference between those and the more naked trees, except that they appeared more luxuriant in the extremity of their branches. No. 6. At Langold, in Yorkshire, the trees are not generally so large as those at Stoneleigh; but the two places agree in the Ivy not having been so much destroyed as is generally the case; and, both in examining the trees near each other and those growing from the same root, I was confirmed in my opinion. No. 7. In a lane betwixt Hertford and Hatfield there are many very large old Thorns in the paling of Hatfield Park so covered with Ivy, that in the winter of 1808 I thought it an evergreen hedge, and the sprays of the thorns were hardly visible; yet when compared with a few Thorns in the same lane, they appeared to be equally vigorous. Last summer I was surprised to miss the Ivy, till I perceived that the foliage of the Thorns had so entirely covered it that the Ivy was only a secondary object in Nature's plan of decoration, and seemed humbly to retire into the shade of more luxuriant ornament, to come forward again, as I have lately seen it this last winter when

the neighbouring bushes were reduced to mere sticks. No. 8. At Woburn Abbey the timber has so generally been denuded of Ivy that I despaired of finding any example, except in an Elm near the Duke's apartment, which is very conspicuous (in winter) from its profuse mantle of Ivy. But this was deemed inconclusive, although much superior in growth to some other trees near the same spot, because it was supposed that they might have contributed to its growth by sheltering it from the south-west winds. I afterwards discovered in the park a remarkable specimen, which is the uttermost tree of a grove, and the most exposed to the south-west. The tree nearest to it has some dead branches, and seems evidently to have yielded to its neighbour's superior vigour.

I should here further add the result of some experiments made by Mr. Salmon, who has the superintendence of the woods at Woburn. He tried the comparative substance and strength of several kinds of timber with the same kinds Ivy-bound as he calls it; but he could not find any difference, and

is of opinion 'that in old trees it does no harm; and that in trees of ten or twelve years old it neither checks the growth, nor is the wood lighter or weaker; but he is still convinced that he has seen young trees killed by the Ivy.' It remains only to mention

"The advantages to be expected from a less rigorous destruction of this plant: First, it may be stripped from the trees in winter to feed sheep and deer, to whom it is grateful and wholesome food; secondly, its berries are a resource to pheasants and birds during severe weather. And lastly, if it were less unmercifully destroyed our winter's landscape would be greatly improved. I could not but observe the contrast of places visited during the same winter. Instead of that melancholy scenery in parks where no Ivy is permitted to grow, and where each rugged and venerable Oak, without its foliage, presents in winter a picture of old age with poverty and nakedness, the rich mantle of Ivy thrown over the trees of Langold and Stoneleigh gave grace and dignity to age."

STUARTIA VIRGINICA.

Stuartias being somewhat rare and slow in growth at first, many who would enjoy their singular and distinct beauty have an idea that they are difficult to cultivate. The following drawing was made from flowers given by a forgotten bush on the north side of a grove of high Oak trees in very poor stiff soil, in East Sussex. Owing to various displacements of shrubs it had got in this spot by chance; certainly I should never have placed it by design in the position in which it flowered. However, after some years undisturbed in this almost sunless situation, it surprised us by flowering beautifully last year. The flowers were not so large as we have seen them, but the beauty of the plant was about the same; so there need be little doubt that these are among the shrubs for England. The culture is that of the commonest shrub.

TREES FOR THEIR BEAUTY.—I want you to understand, in the first place, that I have a most intense, passionate fondness for trees in general, and have had several romantic attachments to certain trees in particular. Now, if you expect me to hold forth in a "scientific" way about my tree-loves—to talk, for instance, of the *Ulmus americana*, and describe the ciliated edges of its samara, and all that—you are an anserine individual, and I must refer you to a dull friend who will discourse to you of such matters. What should you think of a lover who should describe the idol of his heart in the language of science, thus—Class, Mammalia; Order, Primates; Genus, Homo; Species, *Europeus*; Variety, Brown; Individual, Ann Eliza; Dental Formula.

No, my friends, I shall speak of trees as we see them, love them, adore them in the fields, where they

are alive, holding their green sunshades over our heads, talking to us with their hundred thousand whispering tongues, looking down on us with that sweet meekness which belongs to huge but limited organisms—which one sees in the brown eyes of oxen, but most in the patient posture, the outstretched arms, and the heavy drooping robes of these vast beings endowed with life, but not with soul—which outgrow us and outlive us, but stand helpless—poor things!—while Nature dresses and undresses them, like so many full-sized but underwitted children. . . . Who cares how many stamens or pistils that little brown flower, which comes out before the leaf, may have to classify it by? What we want is the meaning, the character, the expression of a tree, as a kind, and as an individual.—O. W. HOLMES.



STUARTIA VIRGINICA IN EAST SUSSEX.

(Engraved for FLORA from a Drawing by H. G. Moon.)

THE PERSIMMON IN ENGLAND (*Drospyros kaki*).

It is very seldom that we see this handsome shrub in English gardens; but I think it so well worth growing that I wish to say a few words in its favour.

The chief objection raised to it is that it is supposed to be too tender for any but the most favoured places in England. This is certainly a mistake. It must be quite twenty years since my plant was given to me by my old friend, Ewbank, and during that time we have had many very severe winters; yet the plant has never been seriously injured, and even the spring frosts have seldom done it any real harm. Then it is said that the tree requires room and does not repay in foliage, flower, or fruit. I think differently. Even as a fine foliaged shrub I think it worth growing; the leaves are large and handsome, and often put on very rich colours in the autumn. The flowers have little beauty, but the fruit is all that a good fruit should be. The Japanese consider it to be the best of all fruits, and grow many varieties, some suiting one position in the country and others being better for different positions. They say that the flavour is a mixture of Peach, Apricot, and Nectarine; I cannot say that I have been able to detect these different flavours, but should liken it to very good Apricot jam. I only know of one variety, but that, when ripe, is of a rich Apricot-red colour, and makes a very handsome dish for dessert. To get all these excellences some care is required, but not more than is necessary for growing and ripening a good Peach.

The tree belongs to the Ebenaceæ, and is botanically allied to the Date Plum of the United States; and, like many other Japanese plants, I think it probable that it would grow well in the shade, but to ripen the fruit all the sun that it can get is wanted, so I grow it on a south wall, and keep it pruned in rather close. The flowers do not come out till the leaves are well formed, and then they have the habit of hiding themselves under the leaves. As soon as the fruit is set it is well to pick off all the leaves that shade it, so as to admit the full sun to the fruit. The fruits swell rapidly and look handsome on the tree, but they keep quite green till towards

the end of summer, when they begin to turn colour. They will stay on the tree long after the leaves are fallen, and I think it well to leave them on till there is a threatening of frost. Then I should pick them at once, and put them in the sunniest place in the greenhouse. They ripen very gradually, and are not fit to eat as long as any part of them is hard; but as soon as they are quite soft, as soft as a ripe peach, they may be eaten, and they will keep good when quite ripe for many days. Last year I had good dishes on my table till the second week in December, and they were much appreciated.

With this experience of the tree and fruit I wonder it is not more grown; yet outside my own garden I have only seen it out of doors at Tortworth Court, in Gloucestershire; there it grows beautifully in a sheltered corner of the house, but does not ripen its fruit as well as it does with me. The late G. F. Wilson tried it in the orchard-house; he had ripe fruit but did not attach much value to it; and all the fruit that is seen in the shops in November and December comes, I am told, from the South of France. With me the fruit is often over 3 inches through, and compares very favourably with the French in size, colour, and flavour. I may say that ever since the shrub was of fruiting age—and it produces fruit quite as early as a Peach—I have never been without a crop of some sort, and in some seasons I have had six or seven dozen fruits from the tree. I am now trying one in the open ground away from the wall, I scarcely expect that it will produce good fruit; but I am hopeful, for at the present time (April) the foliage is as forward on the one as on the other. I have little doubt that the day is not far distant when the fruit will become popular, and there may be a good demand for it, making it worth while for our nurserymen to grow it for the market. At present it is not popular because it is very little known, as little known as the Banana was a few years ago; but I see no reason why it should not gradually make its way and become as popular as the Banana.

HENRY L. ELLACOMBE.

REVIVING OBSOLETE NAMES OF TREES.—“Some botanists seem to consider it a meritorious act to rescue a forgotten name from oblivion, and look upon such discovery as being of almost as much benefit to science as the detection of some overlooked specific character. Such authors appear to forget that names are merely arbitrary terms to represent the plants to which they belong. The rule that, when a species is already known by two or more names, the earliest given of these is to be adopted, is agreed to solely as a means of attaining unanimity in nomenclature; but the revival of an obsolete

appellation by which no one knows the plant is only producing, instead of avoiding, confusion, and should be discouraged to the utmost.” These words of the late Mr. B. B. Syme are worth quoting in face of the number of needless changes of old names chiefly by American botanists. It is, we fear, often prompted by the vanity of attaching their own names to the new ones. Among the instances of this kind is a change of the name of the beautiful evergreen Magnolia and the generic name of the Snowdrop tree (*Halesia*), changes which we hope no European writers will accept, as they were needless and can but confuse.

EUCRYPHIAS.

THE Eucryphas vary in stature from medium-sized shrubs to trees as much as 100 feet high, and all of them, though still very rare in cultivation, are plants of great beauty and interest. There are, however, only four species known at present, two being found in Chili and two in Australia and Tasmania. This separation of the two halves of the genus, being supplemented by similar instances (such as *Fuchsia* and *Libertia*), is held by geographical botanists to indicate a land connection between the two continents at some remote age.

The Eucryphas have no known close relatives and their place in the vegetable kingdom consequently is doubtful. Sir Joseph Hooker, whom most botanists now follow in the matter, places them in the Rose family, but other authorities have variously put them with the *Hypericums* (whose flowers are very similar), the *Saxifragas*, and the *Limes*. The foliage affords another method of dividing the genus, two species having their leaves simple (or undivided) and two divided (pinnate). It is curious that one of each kind occurs in Chili and Australia, as the following conspectus shows:—

CHILIAN.

1. *E. pinnatifolia* ; pinnate leaves.
2. *E. cordifolia* ; simple leaves.

AUSTRALIAN.

3. *E. Moorei* ; pinnate leaves.
4. *E. Billardieri* ; simple leaves.

With the exception of *E. pinnatifolia*, which is sometimes deciduous in this country, they are all evergreen. *E. Moorei* is not in cultivation, and of the remainder *E. pinnatifolia* is the only one that has succeeded well in the open air. I do not know whether the others have been tried out-of-doors in the milder parts of these islands, but they are certainly worth trying. They should be planted in a rather light soil, in which there is a proportion of leaf soil and peat. Like most Chilian and Tasmanian plants, they require mild and moist conditions. During the hot, dry seasons that have so frequently been experienced during the last decade, it has, in inland districts at any rate, been difficult to establish *E. pinnatifolia*, but it is certainly worthy of every care that can be given it.

E. Billardieri.—The only time I have seen this in flower was in 1891, when it flowered in a greenhouse at Kew. It is an evergreen tree occurring wild at various elevations on the mountains of Tasmania. It has small, narrow, oblong leaves, 1 to 3 inches long, not divided or cut in any way; they are dark, glossy green above, grey beneath, and of firm, somewhat leathery, texture. The flowers are four-petaled, white, short-stalked, and from 1 to

2 inches across, being smaller and less showy than those of *E. pinnatifolia*.

At the lower limits of its distribution in Tasmania this Eucryphia is a tree occasionally 100 feet in height. Higher up the mountains it becomes much smaller and shrubby. It is this more alpine form that has flowered at Kew, and which Sir J. Hooker has distinguished as variety *Milliganii*. For growing outside it would, no doubt, be best. It would probably thrive against a wall, or, in Cornwall, quite unprotected.

E. cordifolia.—Although much commoner in a wild state than its nearest neighbour, *E. pinnatifolia* and introduced to this country in 1851, this species has not spread in gardens so much. For one thing it is not so hardy. It has been planted against a wall at Kew, but has never become really established there. From *E. pinnatifolia* and *E. Billardieri* it is abundantly distinct. Its leaves are oblong, 1½ to 3 inches long, crenated at the margin, heart-shaped at the base, dull green and downy, especially on the stalk and midrib. The young wood is also downy. The flowers are white, and produced singly in the leaf axils. The tree is said to be abundant in the island of Chiloe and on the mainland in Valdivia.

E. Moorei.—For many years *E. Billardieri* was the only species known to exist in Australasia. The late Sir F. Mueller, however, found a second species about a quarter of a century ago in New South Wales, and gave it the above name. There is little to be said about it, for it has never, so far as I know, been introduced to Britain. In any case it is probably less hardy than any of the other three. Like the Chilian *E. pinnatifolia* it has pinnate leaves, but the leaflets are more numerous, and the flowers are white.

E. pinnatifolia.—Introduced to this country from Chili by Messrs. Veitch about thirty years ago, this species has proved to be by far the most valuable of the three Eucryphas in cultivation. Not so easy to establish in new quarters as most shrubs are, it nevertheless appears, when once well started, to be quite hardy in a climate not more severe than that of the London district. In its first home in England—the Coombe Wood Nursery—it has succeeded perfectly, and a specimen there, now some 10 feet or more high, is still, perhaps, the finest in Britain. Even in its native country it is very rare, and has a very local *habitat*. It has only been found on the Cordillera of Concepcion, and is called “Nirrhe” by the Chilians.

Gay, the Chilian botanist, makes the first mention of this shrub in 1845. He found it on the rocky banks of the River Biobio, where in its largest

state it becomes a small tree, 10 to 15 feet high, but usually it is shrubby. Its branches are somewhat erect, and bear the leaves in a cluster towards the end. The leaf is composed of three or five leaflets, which are of a dark, lustrous green, $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long, and toothed. The flowers, being produced in July and August, are valuable as coming when shrubs in flower are scarce. They are borne singly or in pairs, and measure about 3 inches across; the four petals are pure white. The numerous long

stamens with their yellow anthers give character and an added beauty to the flower. This species has produced perfect seed in this country—in Miss Bretton's garden, near Sandhurst, and probably other places. They are produced in hard, woody capsules. Although they germinate freely, young plants are not always easy to raise from them. The species, can, however, be increased by layers.

W. J. BEAN.

Arboretum, Kew.

THE YELLOW GIANT ASPHODEL.

THIS rare and extremely beautiful plant—the most beautiful, we think, of a very striking family—we have never seen quite so well cultivated as with Mr. Ernest Ballard, at the Court, Colwall, near Malvern, who kindly sends the following notes of his mode of cultivation:—

Eremurus Bungei.—During the autumn of 1900 I obtained three flowering roots of the above, and planted them in a well-prepared, well-drained hardy perennial border. Two only lived; they received no special attention (except in planting)—during severe frost they were just covered. In 1901 and 1902 they flowered profusely. Having formed a large number of crowns, I decided to try division of one plant, leaving the other alone. On very carefully raising it, which I did with my fingers (any tool breaking the roots, which are more brittle than *E. robustus* or *himalaicus*), I found it had eighteen distinct crowns, which naturally divided themselves, without any breaking, into threes; so I planted six separate trios in a newly-made border, in a warm position (south aspect), with a large Yew tree as a guard and background. This was done last October. A month ago we had heavy rains, followed by sharp frosts (12 to 15 degrees) for several nights, and I

fear a few of the crowns have been injured, but most of them look very well.

The soil is a heavy loam on a strong red clay, but in making a border I have always got the ground out nearly 2 feet deep, and filled in with a mixture of old turf, top soil, well-decayed manure, and some sandy road scrapings. In planting I make a small hillock of soil, the top of which is formed of a double handful of coarse white sand mixed with an equal quantity of lumps of wood charcoal. This ensures perfect drainage of the crown, and helps the plant to fight the winter months.

When established I believe they will do unprotected, except, perhaps, in severe frost, when a light covering may be used. Too much covering promotes premature growth, and so there is a greater chance of injury. I believe a sheet of glass placed obliquely over the plant, allowing free circulation of air, during very wet times would form an excellent protection. I am trying this. I also feel quite sure that if dividing were done in the spring (March end) it would be perfectly successful. It is courting disaster to move in autumn, and subject the large fleshy roots, when dormant and possibly injured, to the alternate wet and frosts of winter.

GOOD WORK FOR THE AXE.

A GREAT number of places throughout the country suffer from ignorant and thoughtless planting of trees in the wrong place as to kind and stature, and ugly overgrowths of all-devouring evergreens, like the pontic *Rhododendron*, common Cherry-Laurel, Privets, and other nursery rubbish. Few seem to see how much their home landscape is shut out and their pleasure gardens made dismal, and, indeed, sometimes almost uninhabitable, in this way. To those in any doubt about it, the following words by one of the best gardeners and planters we have known, the late James McNab of the Botanic Garden at Edinburgh, may give courage to think and in due time to act. It is, however, difficult to express in words the harm done to the home-landscape by stupid planting abandoned to its own redundancy. Apart from these sources of evil, there is the hopeless human one of the man who will not allow a tree to be cut down,

no matter how ill-placed or how much air or beautiful view it shuts out. This too common type is often quite proud of its doings, and is not to be dealt with by the axe; it suffers from blindness in not seeing only one side of a very serious artistic question. It is a common thing for even the finest groups and best trees about a country house not to be rightly or well seen, owing to unmeaning trees and coarse shrubs being massed about the house itself, sometimes even to the exclusion of light from the living rooms as well as landscape beauty, so easy to enjoy in many parts of our islands.

When grounds are first planted the trees are small, and the views so extensive that the possibility of these being ultimately shut out is never taken into consideration. As time rolls on, many houses become buried amongst a dense forest of trees, and few of the original views are visible, unless one ascends to some eminence. Such shut-up places coming into the market are frequently undisposed of for a length of time, owing to their close and damp nature, the owner never for a moment thinking that such closeness can be easily cured. Some often secure such places, and immediately commence a reformation; the charm worked by the woodman's axe, with the aid of the artist or landscape-gardener, is often marvellous, and, at a trifling expense, in certain cases the nature of the thinnings paying for the improvements. The stem-pruning of a few of the large trees often produces a pleasing effect in giving us views between the stems and beneath the spreading branches. The removal of trees altogether, and the stem-pruning and branching of others, give views without in the least degree injuring the health of the trees. There is a mansion

known to me, on a somewhat rising ground about half a mile from the sea, but shut out from it by large trees and a thicket of evergreen shrubs, where by the removal of some of the under branches of the large and widespreading trees, the clearing or thinning out of a few of the evergreens, beautiful views of Inchkeith and the Firth of Forth have been obtained from the principal windows. At another large mansion, the removal of an oak tree in front of the drawing-room windows has opened up on one side a rich expanse of country, with hills and wooded glens, before scarcely visible except through a network of branches, and that only during the leafless months. On another property, the breaking through belts of Spruce has been the means of varying and improving the foreground landscape, besides bringing into view a range of hills and wooded banks. Although these remarks refer to views from houses, they apply also to the wooded banks of rivers, extensive woods, and wooded glens quite remote from dwellings. The eye, when once practised to such landscape effects, will find on many properties numerous spots for such openings.

SEASHORE GARDENING AND PLANTING.

I HAVE often seen articles in the papers on plants and trees that grow well near the sea, as if it were difficult in our islands to grow plants there. My question would rather be: What cannot we grow by the sea? when I think of all the lovely things I have seen in our island gardens, from Caerhaes in Cornwall, to Castlewellan in the north of Ireland. Island gardeners and planters should love the sea, as clearly some of them do, or we should never have such lovely places as Mount Ussher, Tregothnan, and many gardens along the shores and estuaries of Cornwall and Devon. It is a common error to suppose that these beautiful effects by the sea are only to be had in the South; because we have the striking instance of Lord Annesley's work in the North of Ireland, who has, perhaps, the best collection of all.

There is no doubt success is to a great extent a question of shelter, and one may often secure that near the sea as anywhere else, in sheltered hollows near and behind hills lying against the prevailing winds. Certainly if we do

nothing but leave the bare shore-fields to the winds we do not get much beauty ; but if the least care is taken in building up shelter for seashore shrubs and trees, then all is easy, especially with such a splendid aid as the Holm Oak, which at Abbotsbury is put for a friendly evergreen wall round every new plantation, even in that sheltered dell by the sea. It is a tree which fears no storms, and never gives way before them, and which loves the sea.

It is not the seashore folk and those who dwell by their many river valleys and estuaries that are to be pitied, but rather those struggling with inland and midland conditions in our islands. For those who have to face such terrible winters as those of Hungary and Central Germany there is no chance to walk in avenues of Palms, like Mr. Fox at Falmouth, or lovely Tree Ferns, Bananas, and Gum Trees, as at Menabilly ; so that our privilege as island gardeners is a singular one in Europe, considering our northern position, and we ought to take advantage of it. In no northern country can we see such a variety of charming vegetation, Himalayan Rhododendron, Banana, Palm, Indian Magnolia, and a list of things which would fill the whole of FLORA. It would take a long time to free people's minds of the idea that it is only in the warm and often relaxing southern country that such beautiful results may be got by planters and gardeners ; but we can see how wrong it is by such instances as those of Mr. Acton on the hills of Wicklow, and also the lovely plantations at Bodorgan on the stormy coast of Anglesey. Given the same shelter and care in bracing and northern places very beautiful results may also be had, with a few possible exceptions, in favour of the Firebush and a few others that so far thrive in the south only. As to the lovely Himalayan Rhododendrons, there seems to be no shore limit to their culture near the sea—some of the finest flowers come from the West of Scotland. Not only coast gardens may be beautiful, but also plantations of trees of the highest value, as, by working up from the shore, with small storm-resisting shrubs and trees, we soon get, even in level and apparently exposed shores, the shelter which gives us a warm, protecting, evergreen forest, itself a splendid shelter for the garden.

Few countries are so rich in sheltering trees as our own, owing to the evergreens that thrive in seashore districts. Shelter may be near for flower beds or distant for wind-breaks, across the line of prevailing winds, and may be of Yew, Holly, Cedar of Lebanon, native Fir, and a few Firs, and the Ilex.

Among the kinds of shelter, walls, thickly clad with climbers, evergreens and others, are often the best for close garden work, because they do not rob the ground, as almost any evergreen tree will ; and in doing their work, they themselves may bear many of our most beautiful flowers. Half-hardy evergreens, like the common Cherry-Laurel and Portugal Laurel, should not be planted to shelter the garden, because they may get cut down in hard winters even in southern districts.

By the use near the sea of small-leaved trees like the Tamarisks, Sea Buckthorn, and small Willows, we very soon get a bit of shelter, and by backing these with the close-growing conifers like our common Juniper and some of the sea-loving Pines like Pinaster, and the Monterey Cypress (*C. macrocarpus*) and the Monterey Pine (*P. insignis*), we soon get shelter for our trees, and fifty yards away we may soon walk in warm woods. Having got our shelter in this way the growth of the hardy Pines of the northern world seems as easy by the sea as anywhere; indeed, more so, because if there is any one place where the rather tender Pines are grown well it is near the sea in places around our coast, where, if the soil is good, one has not to be so careful about the hardness of trees we select as we have to be in inland places.

The evergreen Oak is the most precious of the trees near the sea; but as it is not very easily transplanted from nursery-bought plants, it is just as well to raise it on the place and plant it young. Seed may be scattered with some advantage in places we wish it to grow in, as it grows freely from seed. This evergreen Oak withstands gales better than any other tree. It is a precious tree for the south and west and all seashore districts, and should never be forgotten among the crowd of novelties among trees. Like many other trees, it suffers from indiscriminate planting with other and sometimes coarser things, and is rarely grouped in any effective way, although here and there, as at Ham House, Killerton, St. Ann's, Tregothnan, and Holkham, we may see the effect of grouping this tree in picturesque ways. There are many noble trees of it in coast districts in England and Ireland; but where there is room the tree should be grouped or massed, as, apart from effect, we get the best shelter in that way. The tree, also, is an enduring one, and will remain with us when severe winters will make the difference between Californian and British very clear.

Among the taller Pines the best is the Corsican, and, both from the climate of its island-home, on the mountains, and the result of trials in various parts of England and Ireland, we may make up our minds about it.

The Pines of the Pacific coast, too, are well used to sea influences, and hence we see in our country good results from planting them near the sea, as, for example, Menzies' Spruce at Hunstanton, the Monterey Pine at Bickton, the Redwood in many places near the sea. One good result of planting in such places is that we may use so many evergreen trees, from the Holly to the Cedar, and so get a certain amount of warmth as well as shelter.

For lower-sized trees and intermediate shelter two groups of low trees are excellent and as yet little used: the Arbutus, all in cultivation, good for our purpose and beautiful, too; and the Phillyrea, all of which love the shore, as do the Escallonias, often pretty within reach of the spray.

GARDEN DESIGN AND RECENT WRITINGS UPON IT.*

OF all the things made by man for his pleasure a flower garden has the least business to be ugly, barren, or stereotyped, because in it we may have the fairest of the earth's children in a living, ever-changeful state, and not, as in other arts, mere representations of them. And yet we find in nearly every country place, pattern plans, conventional design, and the garden robbed of all life and grace by setting out flowers in geometric ways. Among the recent writers on garden design, one tells us that the gardener's knowledge is of no account, and that gardens

should never have been allowed to fall into the hands of the gardener or out of those of the architect; that it is an architectural matter, and should have been schemed at the same time and by the same hand as the house itself.

The chief error he makes is that people, whom he calls "landscapists,"

*Formal gardens
made in our
own day.*

destroyed all the formal gardens in England, and that they had their ruthless way until his coming. A more extravagant statement could not be made, as must be clear to any one who takes the least trouble to look into the thing itself, which many of these writers will not do or regard the elementary facts of what they write about. So far from its being true, many of the most formal gardens in England have been made within the past century, when this writer says all his ideal gardens were cleared away. The Crystal Palace, the Royal Horticultural

Society's garden at Kensington, Shrubland, Witley Court, Castle Howard, Mentmore, Drayton, Crewe Hall, Alton Towers, and scores of pretentious places. During the whole of that period there was hardly a country seat laid out that was not marred by the idea of a garden as a conventional and patterned thing. So far from formal gardens being abolished, as the Irish peasant said when denouncing absentees, "the country is full of them!" With Castle Howards, Trenthams, and Chatsworths staring at him, it is ludicrous to see a young architect weeping over their loss. Even when there is no money to waste in walls and gigantic water squirts the idea of the terrace is still carried out often in plains and other wrong positions in the shape of green banks often one above the other, as if they were an artistic treat. There are hundreds of such gardens about the country, and the ugliest and most formally set out and planted gardens ever made in England have been made in Victorian days when, we are told by writers who do not look into the facts of the thing itself, all these things were lost.

It cannot be too clearly remembered that "formal gardens of the worst and most deplorable type are things of our own time, and it is only in our own time the common idea that there is only one way of making a garden was spread. Hence, in all the newer houses we see the stereotyped garden often made in spite of

* Reprinted, with additions, from the *National Review*.

all the needs of the ground, whereas in really old times it was not so. Berkeley was not the same as Sutton, and Sutton quite different from Haddon.

Moreover, on top of all this formality of design was grafted the most

*Patterns of
flowers and
carpet-beds
things of our
own times.*

formal and inartistic ways of arranging flowers that ever came into the head of man, ways that were happily

unknown to the Italians or the makers of the earliest terraced gardens. The true Italian gardens were often beautiful with trees in their natural forms, as in the Giusti gardens at Verona ; but bedding out, or marshalling the flowers in stiff lines and geometrical patterns is entirely a thing of our own precious time, and "carpet" gardening is simply a further remove in ugliness. The painted gravel gardens of Nesfield and Barry and other broken-brick gardeners were also an attempt to get rid of the flowers and get rigid formality instead, as in the Horticultural Society's garden at South Kensington. Part of the garden architect's scheme was to forbid the growth of plants on walls, as at Shrubland, where, for many years, there were strict orders that the walls were not to have a flower or a creeper of any kind upon them. As these pattern gardens were made by persons often ignorant of gardening, and if planted in any human way with flowers would all "go to pieces," hence the idea of setting them out as they appeared on the drawing-board, some of the beds not more than a foot in diameter, blue and yellow paints be-

ing used where the broken brick and stone did not give the desired colour ! (I am not writing farce, having had the labour of removing some of these garden "architects' efforts.")

Side by side with the adoption in most large and show places of the

*Loss of old
garden ways.*

patterned garden, both in design and planting, disappeared almost everywhere the old English garden, that is, one with a variety of form of shrub and flower and even low trees ; so that now we only find this kind of garden here and there in Cornwall, Ireland, and Scotland, and on the outskirts of country towns. All true plant form was banished because it did not fit into the bad carpet pattern ! I am only speaking of what everyone must know who cares the least about the subject, and of what can be seen to-day in all the public gardens round London and Paris ; even Kew, with the vast improvement of late years, has not emancipated itself from this formal way of flower planting, as we see there, in front of the palm-house, purple beet marshalled in patterns. But we shall never see beautiful flower gardens again until natural ways of grouping flowers and variety of true form come back to us in the flower garden.

After the central error above shown there comes a common one of these writers, of supposing that those who seek natural form and beauty in the garden and home-landscape are opposed to

*The Wild Garden
does not take
the place of the
Flower-garden.*

the necessary level and often formal spaces about a house. I wrote the "Wild Garden" to save, not to destroy, the flower-garden; to show that we could have all the joy of spring in orchard, meadow, or wood, lawn or grove, and so save *the true flower-garden near the house* from being torn up twice a year to effect what is called spring and summer "bedding." The idea could be made clear to a child, and it is carried out in many places easy to see. Yet there is hardly a cobbler who rushes from his last to write a book on garden design who does not think that I want to bring the wilderness in at the windows, I who have given all my days to save the flower-garden from the ridiculous. A young lady who has been reading one of these bad books, seeing the square beds in my little south garden, says: "Oh, why *you* have a formal garden!" It is a small square embraced by walls, and I could not have used any other form to get the best use of the space. They are just the kind of beds made in like spaces by the gardeners of Nebuchadnezzar, judging by what evidence remains to us. And he no more than I mistook stones for bushes or bad carpets for flowers, but enjoyed vine and fig and flower as heaven sent them. All this wearisome misunderstanding comes from writers not taking the trouble to understand the simplest element of what they write about.

The real flower-garden near the house is for the ceaseless care and culture of many and diverse things

often tender and in need of protection in varied and artificial soils, staking, cleaning, trials of novelties, study of colour effects lasting many weeks, sowing and movings at all seasons. The *wild garden*, on the other hand, is for things that take care of themselves in the soil of the place, things which will endure for generations if we suit the plants to the soil, like Narcissi on a rich orchard bottom, or blue Anemone in a grove on the limestone soil as in much of Ireland. This garden is a precious aid to the other, inasmuch as it allows of our letting the flower-garden do its best work because relieved of the intolerable and ugly needs of the bedding system in digging up the garden twice a year.

Very often now terms of gardening are misapplied, confusing the mind

of the student, and the air is full of a new

term—the "formal" garden. For ages gardens of simple form have been common without any one calling them "formal" until our own time of too many words confusing thoughts. Seeing an announcement that there was a paper in the *Studio* on the "Formal Garden in Scotland," I looked in it, seeking light, and found plans of the usual approaches necessary for a country house, for kitchen, hall door, or carriage-way. And we gardeners of another sort do not get in like the bats through the roof, but have also ways, usually level, to our doors, but we do not call them "formal gardens." There are gardens to which the term "formal" might with some reason be

applied. Here are a few words about such by one Percy Bysshe Shelley, whose clear eyes saw beauty if there was any to be seen in earth or sky :

We saw the palace and gardens of Versailles full of statues, vases, fountains and colonnades. *In all that belongs essentially to a garden they are extraordinarily deficient.*

A few more by Victor Hugo :

There fountains gush from the petrified gods, only to stagnate ; trees are forced to submit to the grotesque caprices of the shears and line. Natural beauty is everywhere contradicted, inverted, upset, destroyed.

And Robert Southey tells us of one where the walks were sometimes of lighter or darker gravel, red or yellow sand, and, when such materials were at hand, pulverised coal and shells. The garden itself was a scroll-work cut very narrow, and the interstices filled with sand of different colours to imitate embroidery.

Such gardens may be called formal without too much disregard of language, and yet one might plant every one of them beautifully without in the least altering their outline. *It is only where the plants of a garden are rigidly set out in geometrical design, as in carpet-gardening and bedding-out that the term "formal" is rightly applied.*

We live in a time when men write about garden design unmeaning words or absolute nonsense ; these, as any one may see, are men who have had no actual contact with the work. They think garden design is a question that can be settled on a drawing-board, and have not the least idea that in any true sense the art is not possible without knowledge of many beautiful living things, and that the right planting of a country place is of far greater importance than the ground-plan about the house.

In many books on garden design the authors misuse words and confuse ideas. One, writing on the gardens of Hampton Court, is not satisfied with the terms "garden design," or "laying out gardens," but uses the word "gardenage." Another writes "lay-out" for "plan." Many, not satisfied with the good word, "landscape gardener," used by Loudon, Repton, and many other excellent men, call themselves "landscape architects"—a stupid term of French origin implying the union of two absolutely distinct studies, one dealing with varied life in a thousand different kinds and the natural beauty of the earth, and the other with stones and bricks and their putting together. The training for either of these arts is wide apart from the training demanded for the other, and the earnest practice of one leaves no time, even if there were the genius, for the other.

The term *landscape-planting* is often scoffed at by these writers, yet it

**Landscape
gardening.**

is a good one with a clear meaning, which is the grouping and growth of trees in natural forms as opposed to the universal lining, clipping, and shearing of the Dutch ; and the acceptance of the natural forms of the earth and the natural incidence of light and shade and breadth as the true guide in all artistic planting. The term *landscape-gardening* is a true and, in the fullest sense, good English one, with a clear and even beautiful meaning, namely, the study of the forms of the earth, and frank acceptance of

them as the best of all for purposes of beauty or use of planter or gardener, save where the surface is so steep that one must alter it to work upon it.

We accept the varied slopes of the river bank and the path of the river as not only better than those of a Dutch canal, but a hundred times better; and not only for their beauty, but for the story they tell of the earth herself in ages past. We gratefully take the lessons of Nature in her most beautiful aspects of vegetation as to breadth, airy spaces, massing and grouping of the woods that fringe the valleys or garland the mountain rocks as better beyond all that words can express than anything men can invent or ever have invented.

We love and prefer the divinely-settled form of the tree or shrub or flower to any possible expression of man's misguided efforts with shears, such as we see illustrated in old Dutch books where every living thing is clipped to conform to an idea of "design" that arose in the minds of men to whom all trees were green things to be cut into ugly walls. We repudiate as false and ridiculous the common idea of the pattern-monger's book, that these aspirations of ours are in any way "styles," the inventions of certain men, as we know that they are based on eternal truths of Nature, free as the clouds to any one who climbs the hills and has eyes to see.

The fact that ignorant men, who have never had the chance of learning these lessons, make pudding-like clumps in a vain attempt to diversify

the surface of the ground and other foolish things, does not in the least

*The true test
of a
flower-garden.*

turn us aside from following the true and only ways to get the best expression possible of beauty from any given morsel of the earth's surface we have to plant. We sympathise with the landscape painter's work as reflecting for us, though often in a faint degree, the wondrously varied beauty of the earth, and in the case of the great master-painters full of truth and beauty. We hold that the only true test of our efforts in planting or gardening is the picture. Do we frighten the artist away or do we bring him to see a garden so free from ugly patterns and ugly colours that, seen in a beautiful light, it would be worth painting? There is not, and there never can be, any other true test.

Even if our aim is right, the direction, as in many other matters, may be vitiated by stupidity, as in gardens where false lines and curves abound, as in the Champs Elysée. It is quite right to see the faults of this and to laugh at them; but how about those who plant in true and artistic ways? In the case we mention there is ceaseless and inartistic and vain throwing up of the ground, and sharp and ugly slopes, which are often against the cultivation of the thing planted.

The rejection of clipped forms and book patterns of trees set out like lamp-posts, costly walls where none are wanted, and of all the too facile labours of the drawing-board "artist," in gardens first affected in England

in what we call pleasure-ground and park, is set down by these writers on garden design as the wicked invention of certain men. No account has been taken of the eternally beautiful lessons of Nature or even the simple facts which should be known to all who write about such things. Thus in "The Art and Craft of Garden Making" we read:

So far as the roads were concerned Brown built up a theory that, as Nature abhorred a straight line, it was necessary to make roads curl about. Serpentine lines are said to be the lines of Nature, and therefore beyond question the only proper lines.

But nothing of the fact that in making paths or roads in diversified country it is absolutely necessary to follow the line of easiest gra-

Facts of natural beauty the source of good design.

dation, and this cannot be a straight line, but is, indeed, often a beautiful bent line. In many cases we are not twenty paces from the level space around a house before we have to think of the lie of the ground in making walks, roads, or paths. We are soon face to face with the fact that the worst thing we can attempt is a straight line. If any one for any reason persists in the attempt the result is ugliness, and, in the case of drives, danger. Ages before Brown was born the roads of England often followed beautiful lines, and it would be just as true to attribute to "Brownites" the invention of the forms of trees, hills, or clouds themselves as to say that they invented the waved line for path or drive. The statement is of a piece with the other, that the natural and picturesque view of garden design and planting is the mischievous invention

of certain men, and not the outcome of the most precious of all gifts, of Nature herself, and of the actual facts of tree and landscape beauty. All who have seen the pictures by the roadsides of many parts of Britain and the paths over the hills, and, still more so, those who have to form roads or walks in diversified country, will best know how absurd such statements are.

The very statement that there is but one way of making a garden is its

Variety the true source of beauty in gardens.

own refutation; as with this formula before us what becomes of the wondrous variety of the earth and its forms, and of the advantages and needs of change that soil, site, climate, air, and view give us—plains, river valleys, old beach levels, mountains and gentle hills, chalk downs and rich loamy fields, forest and open country?

What is the use of Essex going into Dorset merely to see the same thing done in the home landscape or the garden? But if Essex were to study his own ground and do the best he could from his own knowledge of the spot, his neighbour might be glad to see his garden. We have too much of the stereotyped style already; in nine cases out of ten we can tell beforehand what we are going to see in a country place in the way of conventional garden design and planting; and clearly that is not art in any right sense of the word and never can be.

As we go about our country the most depressing sign for all garden lovers (and this often in districts of great natural beauty) is the stereo-

typed gardens, probably made by the "young man in the office" from a book of plans. There is a belief in plans which is most misleading and only suits the wants of professionalism in its worst form and prevents the study of the ground itself, which is the only right way to get the best result.

Some of the new writers have no heart for the many beautiful things in the shape of trees and shrubs which we have known during the past generation or two.

A very few varieties of English trees are sufficient for all purposes, and we have yew for hedges, fine turf for a carpet, and quite enough flowers of brilliant hue that have always had a place in our gardens without importing curiosities from abroad.

No trees in our gardens but English ones! Now, if any fact is clear about gardening it is this, that the garden's charm often arises from variety, not necessarily

*Variety
essential.*

botanical variety, but the difference between a Menabilly and the conventional garden essentially lies in a variety of trees, shrubs and flowers. This writer, and others like him, need to be taught that it is absolutely impossible to make a beautiful garden without the variety which he says is useless. They have not, of course, any idea of the dignity and beauty of the trees of Japan, the Rocky Mountains, and Northern Asia, or America.

One architectural writer says:

It is no use spending money on gardeners and repairs, as it might be much better invested in architectural improvements or waterworks in the pleasure grounds.

Apart from its doubtful taste this is a stupid and harmful idea, as the two arts are in no way antagonistic, but

helpful. Take away all true planting and good gardening from our Castle Ashbys, Longleats or Wiltons, and what do we gain? For remember that the ground about a house, even in slopes which must be terraced, is often but a very small area compared with the planting we may have to do in the home landscape.

But the ugly buildings that strew the land everywhere—Georgian, carpenter's Gothic, Victorian; if we take away the good planting, the one saving grace about them, there will be nothing left but an ugly pile to laugh at. Many of these ugly houses are saved from ridicule by the trees and good planting about them. Good building and good planting go so well together—one helping the other in every way—that it is odd to see any one writing on the subject without seeing that it is so. I cannot suppose for a moment that any good architect or other worker could fail to see the gain of good planting and good flower-gardening in relation to his work. We have only the greatest satisfaction with a country place when both building and planting are good—a rare thing, unfortunately.

To the good gardener all kinds of design are good if not against the site, soil, climate, or labours of his garden—a very important point the last. We frequently see

*Any way good
that best suits
the site.*

beds a foot in diameter and many other frivolities of the kind which prevent the labours of a garden being done with economy or simplicity. In many places where these hard pattern gardens are carried out, they are soon

seen to be so absurd that the owners quietly turf the spot over and let it grow in green sward, and hence in many country places we see turf where there ought to be a real flower-garden. The good gardener is happy adorning old walls or necessary terraces, as at Haddon, as he knows walls are good friends in every way both as backgrounds and shelters; but he is as happy in a lawn garden, in a rich valley soil, or on the banks of a river, or on those gentle hill slopes that ask for no terraces, or in the hundreds of gardens in and near towns and cities of Europe that are enclosed by walls and where there is no room for landscape effect (many of them distinctly beautiful too, as in Mr. Fox's garden at Falmouth); as much at home in a border-castle garden as in the lovely Penjerrick, like a glimpse of a valley in some Pacific isle, or Mount Usher, cooled by mountain streams and sheltered by their rocks.

The same architect turns on the waterworks as his chief solace :

But of all the fascinating sources of effect in garden-making the most fascinating are waterworks. An expensive luxury as a rule, but they well repay the expense.

Well, there is some evidence of the sort of design these afford; some instances terrible in their ugliness (one hideous at Bayreuth). And with

*Waterworks
garden design.*

all the care that a rich State may take of them, can we say that the effect at Versailles is artistic or delightful? Water tumbling into the blazing streets of Roman cities, and nobly designed fountains supplying the people with water was right; but in our cool

land artificial fountains are very different in effect, and often hideous extravagance. Of their ugliness there is evidence in nearly every city in Europe, including our own Trafalgar Square, and that *fine* work at the head of the Serpentine. We have also our Crystal Palace and Chatsworth designed as they might be by a theatrical super who had suddenly inherited a millionaire's fortune. What the effect of this is I need hardly say, but with all our British toleration of ugliness I have never heard anybody enthusiastic about their artistic merits. So far as our island countries go, nothing asks for more care and modest art than the introduction into the garden or home landscape of artificial water. Happily our countries are rich in the charms of natural water—too often neglected in its planting.

Among the great peoples of old, so far as known to our human story,

*Hollow talk of
the day about
art.*

was one supreme in art, from buildings chiselled as delicately as the petals of the wild rose, to the smallest coins in their pockets and bits of baked clay in their graves, and this is clear to all men from what remains of their work gathered from the mud and dust of ages. And from that time of deathless beauty in art comes the voice of one who saw this lovely art in its fulness. *The greatest and fairest things are done by Nature and the lesser by Art* (Plato). There is not a garden in Britain free from convention and carpet-gardening, from the cottage-gardens nestling beneath the Surrey hills to those fair and varied

gardens in Cornwall, which does not tell the same story to all who have eyes to see and hearts to care for the thing itself, and not merely for incoherent talk about it. The only sad thing is that such words must be said again and again; but we live in a time of much printed fog about artistic things—the “New Art” and the “New Æsthetic;” “Evolution,” which explains how everything comes from nothing, and goes back again to worse than nothing; the sliding bog of “realism and idealism” in which the phrasemonger may dance around and say the same false thing ten times over; and, last and least of all among these imbecilities, the teaching that to form a garden one had better know nothing of the things that should grow in it, from the cedar of Lebanon to the violets of the mountain rocks.

This teaching is as false as any spoken or written thing can be; there is an absolute difference between the living gardens and conventional designs dealing with dead matter, be it brick or stone, glass, iron, or carpets.

There is a difference in kind, and while any pupil in an architect's office will get out a drawing for the kind of garden we may see everywhere, the garden beautiful does not arise in that way. It is the difference between life and death we have to think of, and never to the end of time shall we get the garden beautiful formed or planted save by men who know something of the earth and its flowers, shrubs, and trees. I would much rather trust the first simple person, who knew his ground and loved his work, to get a beautiful result than any of those artificers. We have proof in the gardens of English people abroad that where freed from the too facile plans of the “office,” far more beautiful gardens arise, as in the Isle of Madeira, where every garden differs from its neighbour, and all are beautiful. So it is in a less degree in our own island, where the more we get out of the range of any one conventional idea for the garden the more beauty and freshness and happy incident we see.

W. R.

NEW PLUMS AT SANTA ROSA.

THE following extract from a letter from Mr. Luther Burbank will be read with interest :—

“The Plumcots and Stoneless Plums are not yet quite up to my idea of perfection in all respects. I have many thousand seedlings of them, and among them I am finding some that more than fulfil all my expectations in all respects. As soon as these can be more fully tested they will be introduced. I hardly dare to tell you the great improvements I have made in hybrid Plums. You could not possibly be expected to believe it unless you could see the fruit and the trees. However, I will say this much, I have been working for several years in crossing the hardy

American Plum with the Japanese and Chinese and others, and now have selected out some which certainly surpass anything in the Plum line ever seen anywhere. Have just grafted in 25,000 new selected seedlings, which, if they produce anything in the least better, will make it possible to raise Plums everywhere, and of any form, size, colour, flavour, or quality desired, *with or without stones*, with frost-proof blooms and of keeping qualities equal to apples. These are strong words, but they can all be proved by examples from my Plum orchard even now.”

CALOCHORTUS.—We forgot to state that the new kinds of these figured in the first issue of FLORA were drawn in Mr. Robert Wallace's nurseries at Colchester. We hope to have the pleasure of figuring other new species of

Calochortus during the present year, and Mr. Wallace, who has more experience of their cultivation than, perhaps, anyone else in England, will write an article on these plants for us.

FLORA

AND SYLVA.

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[Monthly.

BAG PLANTING.

AN old and dear friend of mine, long gathered to his fathers, had a particular dread of a man going about London with a bag, and I am not sure a country-man with a bag is very much better, so I wish to say something in favour of a man with a bag on a wholly beneficent mission. If in any bold or varied planting in unfamiliar soil we succeed in one half what we attempt we are fortunate; and I think the best thing I ever did in planting was sowing a bare field of some seven acres with Gorse. It was about to be planted—some part was, in fact, already partly planted—with little forest trees, when I scattered the seed broadcast over the field. The field was wired and rabbits kept out, and after five or six years the effect of the Gorse, with the young Pines and Larch growing up and standing a little above it, is splendid. An artist friend came down lately and, standing amid the Oaks in a shaw near, drew a picture of the field looking towards the distant hills. The warm colour of Gorse as a covert in winter is pleasant; I do not know the shrub that does so much for us, and I have sown out of bags several hundredweight of seed in many situations. In old woods it has less chance owing to the rabbits and partly to shade. On railway banks, or bleak, dry, “brashy” places, it thrives and looks at home. Where in clearing fences or old fields a difference of level often occurs—the result of ages of ploughing—it is a good plan to sow Furze on the little rough terraces. There would be no particular advantage in seeking this Furze treasure where the bush abounds, as in many parts of Ireland, Cornwall, and Devon; but in districts where, owing to the heaviness of the soil or other causes, it is absent, it is one of the handsomest bushes one could raise.

As to sowing among young forest trees, I simply take advantage of the spaces between them, and, instead of the Furze being a hindrance to the young trees, it is a gain, inasmuch as the Furze thickly planted is a soil-maker, its leaves falling thickly, and the rapid-growing Pines, closely planted, as they ought always to be, will, after some years, get clean above it and finally get the field to itself. In making the best of fences, the live fence, Furze seed scattered along the banks comes up very soon; it looks very beautiful in such places, and helps to make the fence a more sheltering, dividing line. As so many are

particular about the time they sow or plant anything, I may say that there is nothing to be gained by sowing such seeds early. A very good time is in April, when the nightingale comes, May, or early in June; and, as there is no covering or transplanting, it does not much matter if the seeds are sown at night! It must not, however, be thought an altogether haphazard business, because the man with the bag is supposed to know his plants and the places that are likely to suit them. Furze seed is sold at a low price by all the great seed houses of Europe if bought in any quantity; but this year the seed is much scarcer and dearer than usual. Other kinds of Furze I have tried in like ways, and find that the tall one known as the Foxbrush (*Ulex strictus*) does equally well. It is a very rapid grower and a fine, useful aid for the farm, as it faggots more compactly than any other Furze. The seed, however, is not so easily procured. Much less vigorous than this is the dwarf Furze (*U. nanus*), which abounds in rough heaths in many parts of the country, but the seed is not easily obtainable. It thrives and looks well. Sown in places where a compacter growth is wanted, it is as free and easy as any, and may be sown just in the same way. In all these sowings there is no covering given, the seed is simply thrown over ground likely to suit the plants. The dwarf Furze is beautiful in autumn when all the other bushes are losing their charms, and best for low foregrounds and rather bare, stony places.

The Brooms.—I never fancied these so much as the Furzes, owing to their scraggy habit (when old) not forming such good covert, though they are very beautiful. The best, the Spanish Broom (*Spartium junceum*), flowers much later than the others, and is a showy, handsome plant, growing on any gravelly or sandy place, no matter how dry. I saw no place so suitable for this as a railway bank near, so standing on the top of the bank I scattered the seed and let it fall on a steep slope formed of *débris* and with no soil. The natural soil of the place is about as poor as any on the habitable earth, so that what the Broom had to grow on may be imagined—simply shaly rock—and the bank was overrun by rabbits. After some time the Spanish Broom began to sow itself. I was encouraged to sow more in spite of the rabbits, and there are now thousands of bushes on this waterless, soilless bank, and a beautiful bloom comes in mid-summer after most of the flowering shrubs are past, the effect being good as far as it can be seen. Our native Broom (*Cytisus scoparius*) is a very beautiful plant, though it does not make such good covert as the Furze. I have sown large quantities of it with success where rabbits are kept out, but it is more apt to perish from their attacks than the Furze. I have had, on a sandy bluff, bushes 12 feet high, and it is very graceful where it grows here and there in quarries or rough, stony places. The seed is usually very cheap, and it must not be forgotten in any planting of this sort. The Portuguese (or white) Broom (*C. albus*) is a graceful bush and comes freely from seed, which should be sown in sandy, warm places. Sow early in June. One of my reasons for sowing the seeds of

these things is the difficulty of transplanting them if not bought very young, and even then they often fail. Besides, there is the expense of transplanting and no end of labour entirely got rid of by bold sowing, and my friends and myself see better effects from this work, simple as it is, than has been got in other ways with many times the expense and labour. In garden culture it would often repay to slightly cover the seed, and in sowing small pieces it would be safer to do so; but in dealing with various surfaces about a country place, and using seed freely, I never found it necessary.

* * *

NARCISSUS MAXIMUS, AND THE NEWER NARCISSI.

N. MAXIMUS SUPERBUS was discovered and introduced some few years ago by Mr. W. d'Arcy Osborne, the Rev. C. Wolley Dod, and others, from a locality where it grows wild between Dax and Bayonne. This plant has also been called *N. maximus longivirens*. At its best it is a noble flower, a trifle paler in hue than *N. maximus* proper, and its foliage has the peculiarity of remaining green for a month or longer after that of the garden form *N. maximus*, growing alongside it, has died away.

Its full history was told by Mr. Wolley Dod in the *Journal of Horticulture* at about the time he made a special journey to the wild locality where it grows, or was found growing some years ago. *N. maximus* at its best still remains one of the best of all the self-golden Daffodils. Its one fault is that it does not succeed well on all soils. I sometimes wonder that our Daffodil breeders have not raised self-fertilised seedlings of it by the hundred in the hope of obtaining a *N. maximus* with a better constitution, or, shall we say, a more robust habit of growth. It is the same with Daffodils as with potatoes, they are apt to wear out, being continually increased by offsets and grown year after year on the same soil. New blood in the shape of seedlings, as it seems to me, is one way, and perhaps the best way, out of the difficulty.

N. maximus crossed with *N. Santa Maria*, a wild Spanish kind of splendid colour, might yield fine self-yellow kinds, and it is quite possible that *N. obvallaris* crossed with *N. Santa Maria* might yield us a golden-flowered race of early flowers. M. J. Berkeley is apparently one of the few seedlings from *N. maximus*, but is not so stately, and has a wide spreading perianth of a greenish golden hue and flowering at about the same time.

A very interesting and apparently robust seedling golden Daffodil, not unlike a small *N. maximus*, but rather more shapely, had an award of merit at Birmingham this year. It is named Ducat, and is likely to be heard of again.

N. obvallaris, like *N. maximus*, has a habit of failing on some soils, while quite free in others, and a more vigorous growing *N. obvallaris* would prove a welcome addition to the stock of those who cultivate early flowers for market, or bulbs for pot culture in the greenhouse or conservatory.

In looking over the new seedling Narcissi of 1903 one cannot but notice that they mostly fall into one or other of three lines:—First, we have an influx of the exquisite white or ivory tinted Daffodils, heralded in in 1883 by the flowering of Madame de Graaff. Peter Barr, Mrs. George Barr, Mrs. Hillhouse, Constance Pearson, Loveliness, Francesca, Warley Magna, Mrs. Robert Sydenham, Queen Christina, and many others are modern examples of this class. In this class some allusion may be made to the giant self and bicolor Daffodils, which have irreverently been termed “pot-house flowers,” since their size is in the main their only recommendation. An exception may be made in the case of Royal, a solitary flower of which was exhibited by its raiser, Mr. Engleheart, at Birmingham recently. Royal is a shapely giant $6\frac{1}{4}$ inches across the expanded perianth and $2\frac{1}{4}$ inches or more across the frilled trumpet: Van Waveren's Giant, Hodsock's Pride, Lady Headfort's seedling, Madame Plemp, Glory of Leyden, and many others are rarely seen in really good form. Amongst the refined or shapely giants may be placed Ellen Willmott, Weardale Perfection, Monarch, Duke of Bedford, and Royal, which so far is probably the largest of all, and will no doubt appear in another season or two in much fresher and more perfect condition.

The second branch of progress is represented by the exquisite crosses between *N. triandrus* and various Daffodils, which fall into the *N. Johnstoni* section, and of which Mr. Engleheart's Snowdrop was one of the early examples. *N. triandrus* acts on the Daffodils as a potent rectifier, and gives to their offspring exquisite refinements of colour, of texture, and of form. We see this very readily in looking

at such flowers as Earl Grey, Countess Grey, Viscountess Falmouth, Cecil Rhodes, Betty Berkeley, Viscount, and Viscountess Visconte, and other dainty variations of this hybrid of the Johnstoni group.

Thirdly, we have what may be called the Engleheart section of star and poet's Narcissi, viz., those having flattened saucer crowns in place of cups. The essential character of the new Engleheart group is the saucer-shaped crowns lying flat on much the same plane as the perianth segments, the saucers being much broader or wider than they are high or deep. Of these there are now many, some with orange or red edged saucers, and of great merit as cut flowers. Princess Mary gave us an early glimpse of this class, and modern representatives are Queen Alexandra, Gold Eye, Red Knight, Orange Star, Clarissa, Ariadne, Astradente, and others now too numerous to name.

In addition to the above we have many additions to the red-cup, star, and poet's section, like Will Scarlet, Flambeau, Bullfinch, Firefly, Vermeil, Vivid, Red Disk, Blood Orange, Occident, Caroline Carver, etc. These are very beautiful as indoor flowers, but should be cut in the bud stage, as the least blink of hot sunshine on a dry day impairs their beauty. Many of them have, indeed, drooping flowers which shade the coloured coronas; but even so they are indoor, or exhibition flowers, rather than useful for ordinary forms of decorative gardening. They are, in fact, somewhat like the Lenten roses, and look very much alike when growing, on account of the backs of the flowers only being seen by the casual observer.

In addition to the above, we have new forms of large star Narcissi of the Sir Watkin type, some white as White Queen, others bicolor like Lady Margaret Boscawen, the sulphur-tinted Hidalgo and Winifred, and self-yellows varying in size, form, and shade of yellow from the type. Some of these large Sir Watkin, or star flowers, have irregularly frilled chalice or saucers, crested on the inside. Of these there were two examples at Edgbaston lately, viz., *N. cristata* shown by Mr. Pope, and *N. Coronation* exhibited by Mr. Walton. Mr. R. O. Backhouse, Sutton Court, Hereford, has this season shown seedlings having a second or basal corona not unlike the catacorolla of some Gloxinias. All these freaks are more curious and interesting to the teratologist than to the gardener; still they show that we are by no means at the end of possible variation in the development of these flowers. The new seedling forms of *N. poëticus* improve every year and many are very fine in form and colour.

Lastly, we are obtaining some very notable new double Narcissi, especially in the Peerless section. Apricot Phoenix, as shown at Birmingham on 16th and 17th April, is a very remarkable flower indeed. It is said to be a constant sport from Sulphur Phoenix, and has shapely blooms of a soft apricot or buff colour, the colour deepening towards the centre of the flower. Doubloon is another spiky, semi-double, bicolor peerless seedling likely to be useful as a cut flower, and Primrose Peerless, an old Irish variety, distinct in colour, has again appeared in good form from several sources this season.

F. W. BURBIDGE.

TREES ON SLOPING GROUND LIABLE TO LANDSLIPS.

IN some districts landslips are far from uncommon, and in alterations or clearing land in such a country it is best to be careful to keep surfaces likely to be affected in that way planted, so far as may be. Slopes on such ground cleared of trees, and which for ages may have held sound, sometimes slip after the roots of the trees begin to decay. Roads and drives, too, are apt to give trouble if made near such ground. If near a house or road a landslip may be a very great expense. Unplanted land with the same tendency should be planted at the earliest opportunity with Oak, Beech, or Tree Willows, with a few Spruce between them, and as these trees got old and strong they would hold the bank up. I once, unfortunately, took it into my head to cut down some old Oaks which grew on a slope above a public road, one of

those roads that have been there for ages, and, like so many in the southern country, is well cut down into the earth. Soon after the Oaks were cleared and the stout roots which held the bank together had lost their hold, the great bank began to slip down to the road. The cost and labour I underwent to repair the bank I should prefer not to tell of, but I never regretted anything more than having disturbed my old Oaks. Difficulties of this sort do not arise so much except in diversified country, of which, however, we have so much. In the parish from which I write I have known several instances of awkward slips of this kind, and in one case of a slip near a road endeavours to get over the trouble had to be renewed half-a-dozen times.

PLANTER.

THE BLUE HYDRANGEA.

"IN countries where the soil is granitic, schistic, ferruginous or crystalline, such soils as abound in Limousin, Brittany, or in the Norman peninsula, these plants are remarkable for their beauty. Though so much has been written and said about the most certain means of obtaining the desired blue colour, the problem would still be unsolved but for an occurrence some years ago that was put to practical profit.

Near to Angers there is a lake known as St. Nicolas, near which the sub-soil, composed of flint, silex, and sand, is covered with a deep layer of vegetable mould, which the gardeners of the district purchase for a high price and make use of or sell as 'soil for Blue Hydrangeas.' It is a mixture of flint, roots, and half decomposed leaves, and is beaten up and pounded and then riddled for use. The result is a mould of a peculiar brown colour, greasy to the touch, porous, and absorbing water with difficulty. Used in the pot-culture of Hydrangeas, the plants show vigorous growth, the leaves assume an intensely green colour, the stems are almost black, and the flower-heads a uniform indigo-blue colour. It is strange, but a fact, that if the soil used for plunging the pots, when arranged on planks for summer culture and convenience in watering, happens not to be this particular soil, and a single rootlet escapes from a pot and reaches it, it causes the flowers to take a rosy colour. I had been struck with this singularity, and thought that the presence of lime in the soil accounted for this change in colour; but, as I wanted to be sure, I asked M. Louis A. Leroy, President of the Société d'Horticulture d'Angers, to give me a little of this soil for analysis, which he willingly did, sending me also certain information gathered from his own observations, as also those of his friends. In this way I got to know that the first experiments made with the St. Nicolas earth had not been conclusive, and it had been only after repeated trials that it was found necessary to do the following things:—

"(1.) Wash all roots of Hydrangeas to be potted in the special soil.

"(2.) Continue this pot cultivation for a year, taking care to plunge the pots in like soil of sufficient depth to accommodate the roots as they escape from the pots. The least contact of a root with common soil will cause the blue colour of the plant to change to a dull purple.

"The soil of Angers and its environs is chiefly composed of slate schist, with a good deal of iron. Hydrangeas in a northern exposure and occupying

a place under the gutter of a slate roof frequently take on a blue colour.

"The following is the result of an analysis of the soil for Blue Hydrangeas made by M. Emile Aubin, of the Société des Agriculteurs de France. The mixture contained 76 per cent. of fine earth:—

"*Physico-Chemical Analysis.*—Flint, 24.00; silicious sand, 61.80; clay, 2.16; lime, 0.09; organic matter, 7.55; humus, 0.91; water, 3.49; total 100.00.

"*Chemical Analysis.*—Nitrogen, 0.4103; phosphoric acid, 0.1168; lime, 0.0504; magnesia, 0.2000; potash, 0.0850; soda, 0.0043; oxide of iron, 3.4100; sulphuric acid, 0.0857.

"The soil, it will be seen, is essentially silicious, very rich in organic matter and in humus, well provided with nitrogen and phosphoric acid, but excessively poor in lime and potash. The result of the analysis shows that the Blue Hydrangea abhors the slightest part of contact with a lime soil."—ED. ANDRÉ, *Revue Horticole*.

M. Bouret, of Nice, also writes as follows to the *Revue*:—"Ten years ago I planted a hedge of *H. Hortensia* at the foot of the north front of the Château d'Asson (Vendée) in a granitic, argilo-silicious soil, therefore containing very little lime and phosphoric acid. In ordering my plants I insisted on having only such as bore rose-coloured flowers. But with the first appearance of the flowers there was a disagreeable surprise; there were plants which bore only blue flowers, and others with only rose-coloured flowers; others, again, had mingled blue and rose-coloured blooms, or variegated blooms. I blamed the seller of the plants, who protested that he knew by the evidence of his own eyes that the plants only bore rose-coloured flowers. My curiosity being aroused, I caused the soil to be dug over, and I found mixed with the earth a quantity of slate off the roof. But why both red and blue flowers? The thing was explained when it was discovered that although the centre of the building was roofed with (Angers) slate, the two flanking pavilions were tiled. Where there were slates the flowers were blue, in other places they were rose colour. As for the two colours growing on the same plant, the explanation is, that if a root came into contact with a slate, the corresponding branch bore blue flowers; otherwise it produced rosy flowers. On asking old gardeners of the locality whether they were able to obtain blue flowers at all, the reply was, 'Yes, if we pound up slate and mix it well with the soil.'"

ANCHUSA ITALICA (DROPMORE VAR.).*

HAVING passed one's life almost among herbaceous plants, it seems much to say that the finest plant we have ever seen of that class with blue flowers is this form of *A. italica*, which we first saw in the gardens at Dropmore. A plant in our own ground, in deep recently-moved soil, was a fountain of handsome blue flowers, and gave the best effect we had ever seen afforded by a blue hardy plant. It endured two years, and we hoped to propagate it from seed or in other ways, and that the plant would prove perennial, but it perished after an immense production of flowers. We hope, however, it may be propagated by somebody for general culture. We thought it might have been identified as a new species, as it is certainly distinct from the old form common in gardens; but at Kew they could make nothing of it except a form of *A. italica*, which is, however, quite distinct from this as a garden plant, and it may be a fine seedling form. In any case it is a plant which should not be lost sight of. It belongs to an order in which there are many beautiful plants, of which it is by far the finest in effect. If one could get enough of it, it would be most admirable for grouping among tall plants, and in growing for cutting for the house, as its effect is so cool and good on hot days, having also a very long-continued period of flower. The plant from which our drawing was made was 7 feet high, and as much through.

The best method of increase we know of is by root cuttings. This is a much quicker way than from seed, and far more reliable. The work can only be done in winter, or not later than March, and consists of taking pieces of roots an inch long or thereabouts and inserting them in sandy soil in pots. The largest roots may be cut in halves lengthwise, or even quartered, as the new growth emerges from the outer portion. In a few weeks the shoots appear on the roots, and, when a good growth has been made, the young plants may be treated as seedlings and eventually planted out.

The only other kind of this family which is hardy and useful is the *A. sempervirens*—a neglected plant, but, while not in its best place in the choice flower garden, very pretty and useful in the wild garden, or running about in a shrubbery or banks and hedgerows. It is very free in growth, and its blue flower is very pretty. It is a native or naturalised plant in some waste places, but it is very easy to obtain, and easily increased by division, being a true perennial.

E. H. J.

* With coloured plate from a drawing by H. G. Moon.



PRIMULA F. 1. 2.

NATIVE TREES BEST FOR BEAUTY OR PROFIT.

IF we have eyes for the highest beauty in tree-life we may find that, after looking for it round the world accessible to us, and having gone through all books, pictures, and spectacles of Californian and other giant trees, we may have to seek for its highest expression at home among the kinds native of our Isles. But we live in a time when the pursuit of things exotic is so active that the value of native trees is too often forgotten. We see in books of much show of learning, like Brown's "Forester," that trees are named as being fit for forest work in Britain which are not only of no proved value, but even require a greenhouse to live in, like the Norfolk Island Pine. Catalogues, too, nourish the delusion that we must look to other lands for all our good things, and we see men planting many costly and useless trees, who never plant native trees. Wretched plantations these costly exotic trees often make, as all may see who watch them for a few years. While with the native tree (given a suitable soil) there is no going back, with the foreigner all is risk. It is not a matter of hardiness only ; a tree may be as hardy as the Spruce on the mountains of Central Europe, and yet do as poorly as it does in Southern England. The native tree is ready to respond to every impulse of the season, is happy with our rainfall—often a slight one in many districts—and, given the soil right for it, soon makes in growth an end of all the pretensions of exotic rivals. Soil and right situation every tree must have ; the rock from which springs the column of the Pine will do nothing for the Oak, and any tree, native or exotic, is profitless and ugly on ground it does not thrive on.

As to quality and value of wood, the native tree is by far the best. Nothing else that can be done with the land that suits our native Oak will pay so well while causing so little labour. The natural Beech woods of Normandy and Britain are among those that more than repay the owners. No foreign tree we grow, except the Larch (now stricken in many districts by a disease which threatens to make it useless for us), equals in value the wood of our Oak, Ash, and Tree Willows. The facility of increase of our native trees should also be thought of in their favour ; and it is clear from what we may see in a neglected field that the wealden land in Kent or Sussex would soon be a forest of Oak if let alone. If we plant an arable field—one that has been under the plough for generations—with Pine, we shall probably find Ash, Oak, and Birch, sown by squirrels, mice, or winds, starting up here and there, and keeping pace with the quickest growing Pines. But it is not only the value as timber of our native trees I wish to show, it is their beauty. No trees introduced from other countries equal in beauty our native ones, with the exception of the Cedar of Lebanon. In many districts there are no natural old woods where our native trees could be seen in their forest forms ; but the beauty exists for all who care to see it,

and in many ways. What various forms the Oak assumes in chase, or park, or wood, and, perhaps most impressive of all, in the old Oak woods, where the trees stand tall and close! The tree varies in different counties; such stately Oaks as we may see by the roadside in Warwickshire we never see south of London, where there are many Oaks in many forms. So, too, the Beech, a true northern tree in its vigour; how fine it is in many conditions—on chalky hills and also in the level land, whether in Surrey or the Lothians! It is more precious than the Oak in one way, that we get it in a fine state over such vast areas, trees in Denmark being as fine as those in Northern Greece. The Ash—one of our best timber trees—is often fine in form in old states. There is a whole string of Elms and their varieties in catalogues, but by far the best is our Wych, or Mountain, Elm, a native tree; in beauty and dignity a noble tree, attaining sometimes a girth of trunk nearly, or quite, 50 feet and a height of 120 feet. Our native Poplars are often neglected, the Abele and Grey Poplars being stately trees, and the wood more valuable than it used to be. Among Pines, we have none to surpass our native Fir in form and colour; when old, valuable, too, for timber. The field Maple is a neglected tree, but beautiful trees of it can be seen here and there in woods, as at Mereworth and Brede. The Sycamore Maple is a fine tree in form, as we may see at Knole and other places. This is a tree of which the timber is valuable in certain industries, and it is worth planting, coming, too, so freely from seed. It is supposed to be a naturalised rather than a native tree, but, covering a large area of the coldest parts of Europe, no tree surpasses it in vigour and rapidity of increase. It is storm resisting, thrives near the sea, as in Anglesey, and altogether is one of the best trees for planting. The Tree Willows of Britain have value as timber, but are neglected by planters even of gardens, though none of the variegated rubbish of the nursery gives anything like so good an effect as the white, red, and yellow Willows in winter or summer. The common Lime is not a native of Britain, but two other kinds (*Tilia cordata* and *T. platyphyllos*) belong to our native flora, thus showing, the love of this family for our island climate. The Hornbeam, a true native, is neglected by planters, though it is common in some old woods. The Yew should never be forgotten as a woodland tree, where its shelter for game is welcome. It is too much planted near houses, to the danger of animals, and to the loss of all good flower-gardening, owing to its roots. The Holly, usually in gardens a shrub, is on the hills, and in land that it likes, a tree 40 feet high, and therefore never to be omitted in seeking evergreen effects.

Trees of secondary value as timber are often of great value for their beauty, and should never be forgotten by planters:—Crab, Hawthorn, Aspen, White Beam, Wild Cherry, Bird Cherry (*Prunus padus*), often a fine tree, as at Long-leat; Mountain Ash, Wild Pear (the Pear—in good deep soil, as in Worcester-shire—is a forest tree, and a very fine one), and the Wild Service Tree (*Pyrus*

torminalis), a tree with finely coloured foliage in autumn, though rarely planted, and only here and there seen in fine state, as at Blackdown. The Crab is as handsome as any flowering tree ; the Alder gives us its good colour by the streams in spring. The Mountain Ash, or Rowan, is a tree really deserving the epithet splendid when it is grouped on the hills, or almost anywhere else ; but it is a tree beloved by the rabbit, and many I have planted, in the hope of adding its fine colour in autumn to old woodland, have been all gnawed round and destroyed. On rocky ground the Rowan is lovely where it takes various dwarf forms. The White Beam (*Pyrus aria*) is an effective tree at various seasons and well deserves to be made more of, and also its varieties or hybrids (like *P. latifolia*). Some of the trees which we admire in their individual states are not so often seen grouped, though there is nothing more beautiful than a free group of Aspens on a limestone soil in autumn. In that way, too, Birch, which we often see in the north of Germany, with the white stems rising like silver columns all round, might be more often effectively grouped. Nor is there any introduced tree which is so fine in form when grouped as the Ash, as one often sees it round a farmhouse on the hills or in the North.

* * *

JOHN BAIN.

WITH great regret we have to announce the death, at the very advanced age of close on 88 years, of one of the most skilful curators among the many able men who have been at the head of the Botanic Gardens in Britain, John Bain, of the College Botanic Gardens, Dublin ; a thorough plantsman, an able botanist, and a good and genial man. Mr. Bain was of Scottish parentage, and was born in the year of Waterloo, 1815, in Ireland. Very early in life he acquired a sound knowledge of gardening, and after some experience in private gardens, and also in the celebrated old Physic Gardens at Chelsea, under Mr. William Anderson, he, an active and studious young man, entered the Trinity College Botanical Gardens, then under the direction of Dr. Mackay, author of the "Flora Hibernica," and one of the earlier students of Irish flora. Dr. Mackay founded the Trinity College Gardens about the year 1806, for the Trinity College University authorities, and, being a man of character and influence, he attracted to him men who afterwards became celebrated as able gardeners both at home and abroad, amongst them James Fraser, in after life a

noted landscape gardener and author of a "Handbook for Ireland" ; David Moore, afterwards Director of the Glasnevin Botanic Gardens at Dublin ; his younger brother, Charles Moore, afterwards director of the beautiful Botanical Gardens of Sydney ; the late Ambrose Balfe, Secretary of the Royal Horticultural Society of Ireland ; and John Bain, who first became foreman and eventually assistant curator to Dr. Mackay.

As a friend and amanuensis he assisted in the preparation of the "Flora Hibernica" and other works. On the death of Mackay in 1862 Bain succeeded to the curatorship, and the University Botanic Gardens under his care maintained their usefulness and high character. He was all his life a keen botanist, and to the last retained an accurate knowledge of native plants. His skill as a cultivator of rare exotic plants was very often the wonder of all who saw its results. Thoughtful, humorous, and observant, he had no regard for routine culture, and was one of the first to adopt a more airy and rational treatment for orchids and other exotics. The Rev. Wm. Ellis visited the College Gardens and sent Bain plants of the

famous Lattice Leaf plant (*Ouvirandra*) and *Angræcums*, which he had discovered during his travels in Madagascar. Dr. Gardner also sent Mackay and Bain plants of the original *Cattleya Labiata* and *Zygopetalum Mackayi*, which he had found wild in Brazil. Dr. Harvey delighted Bain by saying that the large-flowered *Disa* as grown in the College Gardens was as fine as any he had seen growing on Table Mountain. With these and many other plants, such as exotic *Droseras*, *Sarracenias*, *Cephalotus*, *Vanda cærulea*, and the Dove Orchid, or *Peristeria* of Panama, Bain was completely successful, at a time when they were rare and their cultivation little understood.

Visitors to the University gardens in those days as now were frequently of high scientific or literary standing: eminent physicians and surgeons like Stokes, Crampton, Corrigan, Hudson, Butcher, and even Archbishop Whately and other divines, enjoyed Bain's conversation among his plants, and Whately

especially was one of his constant visitors. Although Bain wrote little himself, he was never weary of aiding others with advice or genial criticism. The late William Archer, librarian of the Royal Dublin Society, and afterwards of the New National Library; the late A. G. More and Mr. Thomas Bewley, one of the most generous of Dublin merchants and an enthusiastic amateur grower of choice exotics, were among Bain's more intimate friends.

During his younger days at the College Gardens Bain was a zealous and active collector, and he rendered Dr. Mackay great assistance in his early morning lectures, as also on the occasions of the field botany or collecting expeditions through the neighbouring country. Even late in life, both at Dublin and at Holyhead, Bain would walk miles in order to show his friends the habitats of rare and beautiful plants, and to him many of us owed our first glimpse of not a few uncommon native plants.

A little collecting tour with John Bain, even in his older days, was an experience no naturalist would ever be likely to forget.

An excellent woodcut portrait of John Bain was published in *The Garden* for June 26, 1889, which half-yearly volume was dedicated to him as having been honourably connected with the College Botanic Gardens, Dublin, for a period of about fifty years. Bain before his death was one of the oldest of living associates of the Linnæan Society of London. Although of a sensitive and retiring disposition, he could hold his own with the best, and was ever genial and generous to all those who really knew and respected him, and to many of these now living his memory will long remain green. He died at Holyhead on Tuesday, April 28, and was laid to rest near the avenue of old gnarled hawthorns in Mount Jerome Cemetery at Dublin, on the 1st day of May, beside his brothers Robert and William Bain, James Fraser, Dr. Mackay, and others of the old friends of his youth.

F. W. B.



THE GREATER TREES OF THE NORTHERN FOREST.—No. 3.

THE AROLLA, OR SWISS PINE (*Pinus cembra*).

THE Arolla (sometimes called the Swiss Pine), the most beautiful and valuable Pine of the high mountains of Europe, has hitherto been grown in England as an “ornamental” tree, and often badly grown, being planted in an isolated manner in the grass, which sucks up most of the rain that falls on the surface, so that the tree is starved in dry seasons. From its high northern distribution and the fine quality of its wood, and every quality that can make the Pine valuable to the forest planter, this should be one of the best of all trees for the bare mountains of Wales, Scotland, and any other elevated part of our islands. Its growth is rather slow, as generally grown with us, but time counts so little in forest planting that we ought to think more of the final result, and always bear in mind that our own rapidly grown trees in Britain are poor in quality, very poor compared with the slow-growing trees of the mountains. The following account of the tree in one of its most important areas is by Herr Anton Woditschka, one of the Forest Inspection Commissioners to the Austrian Government, and is, with the author’s permission, reproduced here from the *Oesterreichischen Forst- und Jagd-Zeitung*.

It is rightly called the Queen of Alpine forest trees. It has a capacity for enduring storm, snow, and ice on the bleak regions of the farthest range of tree vegetation which no other tree has. Its presence serves as a protection against avalanches. At an altitude of 4,500 to 6,600 feet above sea level, beyond the farthest limit of alpine tree life, remains of isolated Swiss Pines can yet be seen. It is, however, not exactly adapted by Nature for solitary existence, as these scattered specimens bear witness—for example, in the Raschotz in Grödenthal. In remoter times, before the destruction of alpine forests to make room for pasture, the tree was much more plentiful. The extent and magnitude of the Swiss Pine forests in those times are proved by the immense quantities of the wood which was consumed as fuel for the salt pans. Old stumps and decayed roots of trees, overthrown by wind or avalanche, are still found on the high mountain sides, proving how extensive was the area over which this tree grew. Where the Swiss Pine suffers but little from the depredations of men, as in the Rittnerhorn region and the southern Tyrol, it is seen in a flourishing condition, the old stems surrounded by young plants showing that, given a fair chance, a much



SWISS PINE,
SHOWING FORM OF OLD TREES

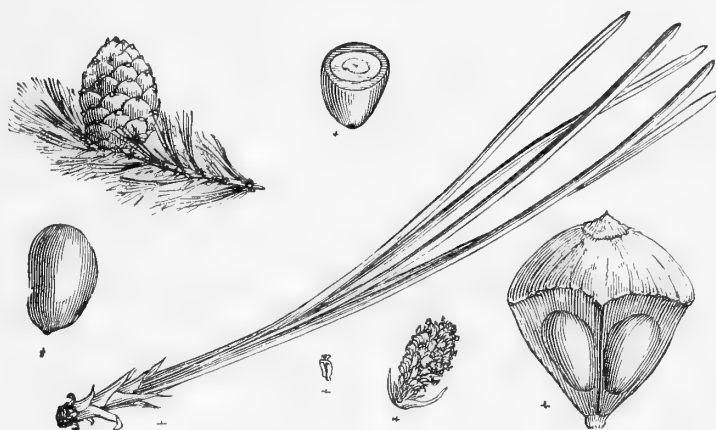
wider distribution of this valuable tree might be expected. The Swiss Pine loves especially the northern and south-eastern slopes of the mountains. One often sees it on the furthest ridge of the mountain, occupying some crag of more than usual prominence, bidding defiance to storm, and one asks one's self how it came to be there. On the sunny slopes of the mountain it is seldom seen, the light soil and continual drought being unfavourable to its young growth. The seedling trees require no protection, though some protection is always desirable. It seeds and grows best among the alpine Roses and dwarf Firs, under the bushy branches of which it finds the richness and the humidity of soil it likes. The young tree flourishes as well under the shade of the parent tree as away from it. It is mostly met with singly and in groups or in association with Larch, Fir, or Pine. Its growth is very slow at first, and in its eighth year it is scarcely 15 inches in height ; but, on the other hand, the growth is regular and continuous. In its earliest youth it forms a branchy, closely-set stem, and it seldom exceeds 65 feet in height, even at maturity, but, on the other hand, is of remarkable girth. The bark of the sapling is brown and supple, and of the old tree dark brown and strongly marked with horizontal rings, which give the tree a distinct appearance. The development of a second leading shoot is usual, and in the old trees it is quite common to see more than one head. The form of the crown is singularly handsome, and the branching is regular. The flat, spreading, or one-sided head is not seen in the Swiss Pine. The annual growths are not only apparent on the inside of the crowns on the whorls, but also on the outside at the points of the branches, which are erect and very regular. This gives the crown at maturity its blunt cone shape, as, although the head is formed of more than one branch, the growth of these branches is perpendicular and almost equal. At the ends of the slightly upturned branches the foliage forms in tufts of five about the twig, and, like the branches, has an upward turn. A single leaf measures from 2 to $3\frac{1}{2}$ inches long, and is three-ribbed in form, one of the ribs being green and shining and the other two whitish, which imparts to the tree its glaucous tones. The foliage is very thick, and on the crown, owing to the shortness of the annual growths, which gives it a crowded look, almost impenetrable to the eye.

Maturity in the Swiss Pine comes late, and trees between fifty and sixty years old do not always bear fruit. The buds on the male tree appear in number from two to seven red catkins at the tips of the young shoots.

Seed.

In the female tree the catkins are pale yellow, with stalks and scales, in twos and threes at the end of the branch, and, owing to the bleakness of the natural habitat of the tree, their earliest appearance is late in the spring, but for the most part not before June. By autumn they will have changed to brown-coloured cones about the size of a walnut. The second year the cones are not ripe until about the end of October, after which they assume a nearly

ovate shape 3 inches in length by $2\frac{1}{2}$ inches in breadth. The colour of the cones is generally bluish, but sometimes yellow, greenish, or brown-red. They are found often in bunches of five at the end of the last year's shoots, each cone standing erect. Each of the woody, thick scales covers two longish three-edged, brown-coloured seeds of about the size of a medium-sized bean. These seeds are winged; the wings growing on the scales, however. The seed has a golden-brown or sometimes whitish-yellow skin, and a pleasant oily flavour, which recommends it to men and beasts alike. The heat of the sun in the following spring opens the scales, and the seeds are scattered by the swaying of the branches to a distance of sometimes as much as 60 or 70 feet, in spite of their weight. They remain on the ground where they fell for a year without germinating. Concerning the so-called "artificial" germination of seed, Herr Gustav Razl, Ranger of the Imperial and Royal Forests, wrote in 1889 as follows:—



"The seeds of the Swiss Pine, which, as is well known, are apt to fall a prey to birds and mice during their two years' sojourn on the ground, are with us (Tyrol) stored—the perfectly ripened ones—in pits on the ground, covered with peat soil. In this state they remain at rest until the following spring, when some of the seed show signs of germinating, those earliest to germinate always proving less strong than the rest. About the end of May the seeds are removed from the storage, and with the sieve that has been used for the purpose of covering them with peat soil they are again freed from the soil, so that only a sign of peat remains on the dark colour of the seeds. The seeds are then packed away in a chest about 8 inches deep, whence they are frequently shaken into a second chest in order to renew

the air and maintain a condition of moderate moisture. Once or twice weekly the seeds that have germinated are picked out and transferred to nursery-beds. The rest are returned to the pits, and, with frequent transfers from one box to another in the meantime, they remain there until they germinate in the following spring. It is noticeable that the seeds of first year's germination do not nearly possess the lasting quality of those of the second year. My experience is that artificial seed-forcing so often recommended is not to be advised, especially as in practice it is found that the seed which is readiest in germinating does not by any means always produce the most useful plant. The process which I have described above I hold to be the simplest, cheapest, and, for nurseries at high elevations, the best."

In the Swiss Pine the seed years recur every six or eight years, not oftener. The seed production is at times so rich that many trees are actually overloaded with cones. In the case of no other of our forest trees is the seed so systematically collected, yet not so much with the object of propagating a valuable tree as for sale as a table delicacy. The collector hastens to gather the seed even before it is ripe, in the fear that it may fall a prey to some other depredator. It is not easy, therefore, to obtain perfectly matured seed, and in the purchase of such the greatest caution is called for. The perfectly ripe seed has a hard brown shell and a pale-yellowish, full, and firm nut. For sowing, the

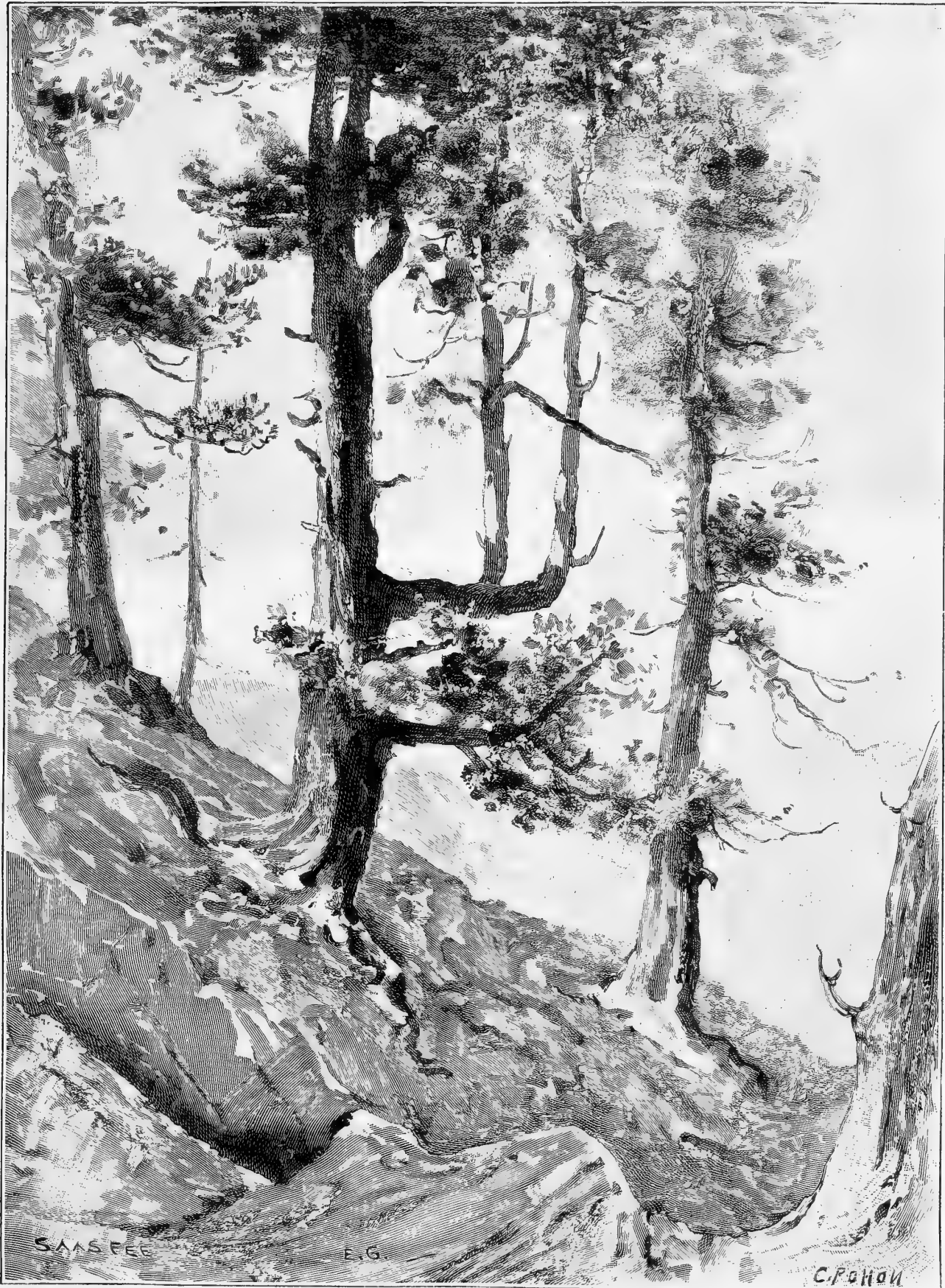
best is obtained from the broken cones in November, and, after free exposure during the winter, it is on the approach of spring transferred to a place of moderate warmth and repeatedly and thoroughly stirred. A way which is practised chiefly in the Brixen and Bozen districts is to collect the cones in heaps in the forest itself, and by means of sticks beat or stir until all the seeds are threshed out. These are then cleaned and spread in some airy place on the ground to dry, being again thoroughly stirred for the prevention of must. If the seed is to be kept in store it should not be put into sacks, but should be kept—in the cone or otherwise—in some cool, airy place, where it will retain its germinating quality for years.

The roots of the Swiss Pine are very strong and spreading; deep-rooted, however, it is seldom upturned because of the shallow, rocky nature of the ground,

Root and growth. but the roots cling to the rocks and stones all the faster for this reason, and force their way into the clefts, so that the tree possesses greater stability and resisting power against the strongest storm, and it seldom happens that a Swiss Pine is overthrown by force of wind. The chief cause of destruction, therefore, apart from old age, is lightning. Owing to this comparative immunity, the Swiss Pine at the outer edge of the mountain forest serves as an excellent screen in breaking and weakening the force of the wind and preventing the occurrence or lessening the range of avalanches. Although on the Alps there are individual trees known to be more than 100 years old, the average age of the oldest Swiss Pines is from 500 to 600 years. This length of life in the Swiss Pine is the more valuable as the tree becomes more limited in area, and in its native zone in the Alps the cultivation of forest trees is much more difficult and costly than in the milder and lower-lying districts. Owing to its slow growth the tree is not at its best—regarded as a timber tree—until its 150th year, when it reaches its prime. In its lower zone of life the Swiss Pine mixes freely with Larch and Fir and seems to flourish in association with these kinds. This would seem to show that the growth of the Swiss Pine under a good system of forestry, natural or artificial, though attended with great difficulty no doubt for the most part, may nevertheless be well done. The Swiss Pine has a well-formed and, generally, branching stem, and its growth is well maintained up to its 200th year. The quality of the ground it inhabits can scarcely be called good, being mostly shaly, stony, or clayey soil, formed, in fact, of the detritus of primeval slate, or, as in Grödenenthal, of the dolomite limestone.

The wood is in the first instance white, and, when dried and worked, yellow or red-brown, very fine in grain, and proportionately compact. It is also very light, resinous, flexible, and aromatic. When worked up it is apt to blunt tools. It makes very good fuel, giving a steady flame, and as a heat-giver can compare with the Larch. For fuel and for the

Wood.



THE SWISS PINE AT HOME.

(Engraved for FLORA from a drawing by Mr. Ernest George.)

manufacture of charcoal the wood of the Swiss Pine is, however, now-a-days seldom used, except where growing among Larch and Fir it falls a victim to the axe. For building, the Swiss Pine, owing to its scarcity and to the cost of transport from the mountains, is little in demand, although for the construction of alpine huts it proves of an iron-like durability. Trees also that have fallen through age or been shattered by storm or lightning have been known to lie for many years on the ground before decay set in.

The fruit of the Swiss Pine is, as we have said, edible, and large quantities are collected for this purpose as well as for sale to seedsmen. A very good, well-flavoured oil is obtained from the seeds, and the resin obtained from the young shoots is known in commerce as Carpathian balsam.

Edible seed.

Of any forest tree the Swiss Pine should have the least number of natural foes. That arch enemy of mountain trees, the goat, molests it very little; nor does it suffer from insects, owing to the severity of the climate of the high mountains for insect life. Here and there young Swiss Pines have suffered from being rubbed or barked by deer and chamois, and the seed is greatly liked by birds, especially the jay; the squirrel also commits great depredation in seed years. The Swiss Pine suffers nothing from disease. The decay of the crown is the only thing of the kind, and this arises rather from the weakness of age or the action of lightning. The species has, however, such vitality that when stricken by lightning the stem will shoot afresh.

Enemies.

For its well-being the Swiss Pine enjoys a light, cool, moist soil mixed with grit or stone. The opinion formerly held that the tree does badly on a limestone soil is incorrect. If anyone doubts this he may see the

Soil.

proof at Grödenthal, where since 1899 we have planted over 100,000 Swiss Pines on a pure dolomite lime soil, from 6,000 to 7,000 feet above the sea level, out of which not 5 per cent. have hitherto failed and of which most of the young plants have already attained to a height of 24 to 30 odd feet. On very stony or sandy, dry soils the Swiss Pine never attains to handsome proportions. In its native habitats it propagates itself near the parent trees by seed, and the seed is also in many cases carried away by the jay and concealed in the earth, and this accounts for its propagation in many situations where the hand of man could not have taken it. Generally, the cultivation of the Swiss Pine from seed is difficult, and success cannot be assured unless the seed-beds are fully protected against mice and birds. In most of the forest nurseries where the Swiss Pine is raised use is made of so-called "boxes" for this purpose—that is to say, the places set apart for the beds are fenced round with stout Larch posts, fastened together and sunk two thirds of their depth in the ground. The "box" is filled with good soil and covered with a wired frame, the rim of which is made of iron in two independent parts, fastened together

with a hinge so that the upper part can be lifted at will whilst the lower rim remains fast to the box.

In the formation of a nursery for Swiss Pine the following considerations occur :—1. The situation ought not to be lower than 3,280 feet above the sea

*The Swiss
Pine in
the nursery.*

level, and the soil should correspond perfectly with that of the place of cultivation, so that plants raised in slate must not be transplanted in limestone, for instance. 2. The ground should be prepared by digging 20 to 24 inches deep. 3. To prevent the seed or young plants from being washed away by heavy rains the beds should be laid quite level. 4. The plot should not be made on the skirts of a wood, but in a perfectly open situation, so that light and air have access to every part. Water sprinkled on the beds during dry summers does good, but in the case of my own nursery I have found it better, during periods of drought, to cover the seed with Fir branches, not laid on the bed itself, but placed on the paths obliquely, so that the ends, crossing one another, formed a kind of roof, which was a protection against frost and heat alike. It is also a good thing to lay moss between the plants or seeds, as it keeps the ground moist and breaks the force of rain or hail, but, unfortunately, also introduces noxious insects into the garden. The beds prepared, the seed is sown in May or June, according to the altitude and the state of the weather.

For years I have made use of the following simple methods, and raised great quantities of plants of the Swiss Pine. The seed formed part of the November crop, and was at once placed in dry sand in wooden boxes and protected from mice. The boxes of seeds were kept in an airy cellar during the winter, and frequently examined in the meantime. In the spring, before sowing time, the seed was cleaned, and, for protection against mice and birds, mixed with minium, conveyed to the forest nursery, and there placed in moist sand. After about fourteen days the seed was transferred to the beds prepared for it, in drills about 5 inches apart, covered $1\frac{1}{2}$ to 2 inches deep. The seed-beds were not watered, but, as before described, protected with branches of Fir. The next year showed a gratifying success, many of the beds were covered with plants. In the second year the transplanting of the seedling plants commenced.

EUCRYPHIA PINNATIFOLIA.—This beautiful free-growing shrub from Chili bears its flowers early in autumn, when blooming shrubs are rather scarce. The flowers are pure white with a central tuft of yellow stamens. When in flower it is a charming shrub, the chaste white flowers contrasting well with the dark glossy green leaves. It is free flowering, and thrives in a rich loamy soil, when it soon forms a handsome bush of 8 feet or more in height and over 30 feet in circumference. A scarce shrub and

seldom met with in gardens, probably owing to the only means of propagation hitherto being by layers. I should like to ask through *FLORA* if it has up to the present ever been raised from seed ripened in this country? Here plants have been raised from home-saved seed. They took fifteen months to ripen, and the seedlings appeared in two months after being sown. This valuable shrub is sure to be planted extensively once home-raised plants become plentiful.—T. RYAN, The Gardens, Castlewellan.

THE GARDEN BEAUTIFUL.

HOME LANDSCAPE AND HOME WOODS.

EVERGREEN WOODS.

ONE main object of these papers is to show that in a country place, if we are to make the best of things we must consider the wood as well as the garden, and bring them into happy connection with each other: this is necessary for the enjoyment of even half the beauty of the trees we may grow. The next thing to consider in our evergreen wood is where to plant, and this will differ a good deal according to the ground and district. The lines of direction for shelter are all-important, not only for the garden and the house, but also for crops. For the country house it is often desirable to have a sheltered retreat in all weathers, and there is nothing that will give us this so well as the evergreen wood, which may be free from labours of all kinds after planting—unlike most underwoods, which are the scene of much labour and delay. Where, as so often happens, the house is on high ground with open land to the north or the east, we shall have one of the most tempting situations to plant a hardy Pine wood in, not merely for the sake of its effect, but also for the shelter it will give us from the north and east. I have planted such a wood and raised it in ten years to dignity and beauty. Such a simple Pine wood with rides cut through it is far better for effect, shelter, and the growth of trees than the labelled and sticky “Pinetum,” which gives neither timber, shelter, nor beauty. In many districts we see iron-bound clumps dotted over beautiful ground, and worse than useless for effect; also skinny belts not deep enough to keep out the wind. As the common ways of planting are so hopeless, what others have we? Well, this is a question of district, of whether the land is valuable or not and whether it is rich plain or rough upland. Large areas of land have been broken up in all parts of Britain when prices were good which ought never to have been broken up at all, and which are not fit for anything but timber. Think of ploughing with four horses in clay land and expecting to get anything back. The same field which would break a man growing corn at the present prices would give a steady profit if well planted. It is well, therefore, to plant cold and poor fields, no matter what their shape, and from the first year that we plant them we shall have some useful covert. It is not only fields poor from coldness of soil on the clay that are not worth cultivating, because some light lands would be much better if planted.

Very often, in diversified country where the land is not valuable, the old way of very small fields for the stock has become almost useless for the present needs of farming. If there are rabbits about, anything grown in the field is eaten up. Trees begin to spread in, and there is

often hardly room to swing a plough. In such cases it is often a good plan to plant the whole of the field, suiting the tree to the soil and taking care to introduce now and then a change of tree. For example, in the woodlands south of London we often see hundreds of acres without an evergreen tree anywhere. This cannot be good from the point of view of shelter, game, or beauty, and, therefore, it is often well to plant some of these small fields with hardy evergreen trees. Never look in the direction of Californian trees, which are not everywhere successful, but keep to the evergreen trees of Europe—Scotch, Silver Fir, Spruce, Corsican, Austrian, White Pine of Canada, and the Cedar of Lebanon, which people use as a pleasure ground tree only, although it is as easily raised from seed, and as free and vigorous, as any Pine.

Tail ends of fields running into woods, which often necessitate much fencing within a very small area, are also excellent places to plant, especially with an evergreen tree which we wish to encourage, as such

Odd corners. corners and tail ends are often sheltered by the woods about them. By planting these, and making a line of fence round the field, we improve both the field and the wood, and simplify fencing, which is always worth doing.

Apart from taking advantage of the incidents and nature of the ground, there may be a reason to plant for covert in certain positions, and there we must take what ground we can, always keeping to the principle of massing and grouping rather than the narrow straggling clumps which are so common, and,—as they are generally—fenced with expensive and ugly iron. The larger the mass we plant the easier the fencing becomes and the simpler for everybody, both in making and keeping.

For cold and wind-swept districts it is often good to plant on the north and east sides of favourite fields or gardens, and it is pleasant to see how much one can do in the way of shelters with evergreen trees,

Shelter belts. even in ten years, if we exclude rabbits and choose the right kind of tree.

The common idea that good planting means big planting is a great hindrance to getting artistic results or even good timber, and it is essential to learn to enjoy the beauty of little trees and woods, which we may

Time and the evergreen wood. raise in ten years, even by the use of small plants, which, after all, is the true way. It is an error to think that because we put in “large stuff” we shall get a better result. In many cases trees not a foot high will beat those bought in nurseries a yard high. My Corsicans came in a basket, in little bundles not bigger than bunches of groundsel for a bird, and in less than ten years they form a handsome sheltering wood. Certainly the Pine babies make a far from dignified appearance in the world; but how few babies do? And I am quite content to plant small, knowing how vigorously

they will grow in a very few years, and how much better an effect I shall get than by any planting of tall plants to wobble in the wind. Now, to plant in this way and get a good result for all the future life of the grove, we have not only to know the greater trees of the Northern World as distinct in kind, in beauty of form or leaf and in height, but also in relation to time; and hence arises one of the questions concerning good planting for the future, for which all good planting should be.

We have much evidence how quickly woods may be formed by planting in well-considered masses, and by the association of things of like nature, as Firs and Pines; and how a man even beginning after middle age may in his own lifetime hope to see noble woods of his own planting. If anything in the world would be enviable by a tree lover it would be the lot of one still young, with much poor land to plant, as he certainly could in his own lifetime raise stately forests. Such good and rapid results, however, can only be got by the absolute exclusion of hares and rabbits, and the still worse attacks of young horses, or grazing creatures of any sort.

The stock of the ordinary nursery, being in most cases grown for planting gardens and pleasure grounds, should be avoided in the case of forest planting.

Small plants best. For that we must go to the true forest nursery, which will give us young and healthy seedlings, by far the best for all purposes of planting. One or two instances of this may convince the planter of the gain of getting very young trees. In planting a field of Larch, although we knew that small plants were essential, some of those received were so very small that the men put them thickly in lines at one side of the field (in stock as it were) to allow them to get bigger. Left there and forgotten, they grew much better than the regularly set out plants, although much more thickly planted. In another case of planting a field of Corsican Pines and Scotch, consisting mainly of small plants, some parts of the field were planted with larger trees, about a yard high, which happened to be in the place in a plantation, where they stood too close. While the little trees never failed, about two-thirds of those of the larger size perished the first hot season. Thus it will be seen at once what an advantage it is always to get very small and young trees in all planting of woodland and forest. As distinct from pleasure-garden planting I am sure we in the end gain instead of losing time by beginning with baby trees.

As to time in planting, and where we plant good trees in a liberal way, for which there is so often room to spare in poor ground: a plan seldom followed, but a very good one, is that of dating the wood on a stone block, as in the Oak wood at Althorp; or on stout iron posts, as in the woods near Virginia Water. It is very interesting when examining a well-grown wood to know its age, which may also be duly recorded in an estate book of planting—a useful book to have in every estate where the woods are of any extent. My strong date posts of

iron are made at reasonable rates by Messrs. King & Co. of Hull, and, having had some difficulty at first in getting these as I wished them, I have pleasure in stating the fact here.

A common source of failure with the nobler evergreen trees is the mixed, muddle way which is common everywhere with us, and fatal as regards the evergreen wood. *Source of failure.* Planters think merely of the effect of the pudding-like masses they form at first, and follow no principle, the planting being too often a mixture of evergreen shrubs of the south of Europe, forest trees of the north, and conifers of California, or any other country, in one mass, usually uniform back and front, and planted for size only. In Nature trees have distinct habits of growth, and some notice should be taken of this in planting for the sake of effect or for timber. We rarely or never see a mixture of conifers, evergreens, and summer-leaving trees growing naturally in one place; the Oak and the Pine run together sometimes, and as we go up high mountains the Beech and the Birch also, but the association ceases eventually, and we have the Pine on the higher hills, as we have the Oak on the plain and the Willow in the marsh. Nothing like the incoherent mixture which we see in Britain is ever seen in Nature, nor should be seen in any good planting. These remarks as regards stupid mixed-plantings are not addressed to the true forester, but to the many people who, often with good opportunities of planting, never think of the matter from that point of view; so that we see under their forest-evergreens the remains of flowering shrubs and rare evergreens which are quite unfit for such association, but which, grouped by themselves in right positions, would have given a beautiful result. I do not say that some association with summer-leaving trees is not right in the Pine wood; in fact, such trees often come by themselves in planting such woods. Oak, Beech, and Ash in a forest country are blown in, or in some way come uninvited, and often with good effect. Birch and Beech might even be planted among Pines; but that way has nothing in common with the mixture, which is so wrong, of soft-wooded trees with Californian conifers and every conceivable tree that happens to fit in at first, to make a show as to size. And this important thing is but one of many we have to think of, if our planting is to be true and beautiful, and lasting. We live in a time when it is laid down in some books that design has nothing to do with knowledge of trees, and when there is much confusing talk about the name we may give to the mere plan of the ground around the house, while little is said of the planting—among them, views, foregrounds, tree masses, light and shade, breadth, and the many things that may influence the beauty of a country place.

* * *

COLCHICUM (MEADOW SAFFRON).*

THESE are hardy bulbous plants, and are widely distributed throughout the mountainous regions of Europe and Asia Minor. They range in stature from tiny Alpine plants a few inches high, with a large number of small flowers nestling among their foliage, to broad-leaved, stately plants, with tufts of massive lilac, rose, or purple flowers, shaped like a giant *Crocus*. Many of these are elegantly chequered, while the colours of the others are softly blended. One only, *C. luteum*, has pale yellow flowers somewhat like *Sternbergia macrantha* in outline; it flowers with its leaf growth in spring. Upwards of a hundred species have received distinct names; of these about twenty may be regarded as distinct, and good garden plants, the others being mainly geographical forms or kinds of little garden worth. Individual plants of a given species vary somewhat in colour and in other ways, both under cultivation and in a wild state; and to this may be owing some part of the synonyms bestowed on these plants. The flowering season ranges from early autumn to spring, but some, and these the finest kinds, flower in autumn, their leaves and seed vessels appearing early in the new year; others flower in winter, their leaves and seeds appearing in spring, whilst a few dwarf species flower in spring, their foliage appearing at the same season.

Their cultivation gives very little trouble; they require to be planted in August at the latest, if flowers in good condition are desired at that season, and they may be well grown in any good garden soil, that is, fairly rich and moist. They enjoy a warm, open exposure, so that the bulbs may ripen well in summer just before the flowering period. The rarer species grow well and appear to advantage in the front of choice herbaceous plant borders, and are effective on the flat slopes and in the deeper soil of the rock garden, the earth around them covered with a carpet of small shallow-rooting rock plants, such as the smaller Rockfoils, Stonecrops, and Speedwells. Such plants will give to the brittle stem-like tubes of the Colchicums the needful support, and will protect them from injury by encircling the bulbs with their slender roots, preserve the flowers from mud splashes during heavy autumnal rains, and give the background of green, without which no flower appears quite at its best.

The common species, *C. autumnale* and its varieties, and other species which are obtainable in quantity without great expense, are well adapted for naturalizing in grass and in the approaches to woodland, and in broad belts of wild garden. Good effects may also be got by using them freely to clothe the higher banks of streams and ponds. They succeed and increase rapidly in grass land if the site is well drained and the soil of good tilth. They can hold their own

* With coloured plate from drawing by H. G. Moon in Barr's Nursery at Long Ditton.



1. *THE WHITE LILY* (LILY OF THE VALLEY) (LILY OF THE VALLEY)
2. *THE WHITE LILY* (LILY OF THE VALLEY) (LILY OF THE VALLEY)

against all but the strongest grasses, and they rarely fail to establish themselves and form huge clumps in a few years, producing hundreds of flowers from each clump.

C. autumnale (Meadow Saffron), our British species, has rich purple flowers, tubular in form, with cup-shaped perianths borne on tubes 5 inches long. There is a white variety and also a dark purple form known as *atropurpureum*. Planted freely in grass, their effect is exceedingly pretty. *Album plenum* is a lovely white double form, with a delicate pink centre, and *rubrum plenum* is a rosy purple double variety, with paler rose-tinted centre. Both deserve a place among choice plants in the rock garden. Though known long ago, they are still scarce, being slow of increase owing to their free-flowering habit. A protecting carpet of dwarf herbage is very necessary for these double forms.

C. Bivonæ (Bivon's Meadow S.), a native of the Mediterranean region, flowering in late autumn, has pretty star-shaped flowers opening quite flat; they range in colour from purple-rose to lilac, faintly chequered with a darker colour and average from 4 to 6 inches in length and span. The leaves are tapering, slightly glaucous and appear in spring. The plant requires a warm position in the rock garden or warm border, and is most effective planted in colonies of twenty plants or more.

C. Bornmulleri (Bornmuller's Meadow S.), a rare species from Asia Minor, has lovely chalice-shaped flowers 8 inches long and 5 inches across, pale rose or lilac rose when first open but changing to a richer purple with age. The lower half of the flower is white and the free lobes of the petals are spoon-shaped, the leaves appearing in spring. This species is one of the rarest and finest of all, and it should be planted in a good place in the rock garden and deserves every care.

C. byzantinum (Byzantine Meadow S.) is a Levantine species, and its easternmost form (*C. cilicicum*) is very vigorous, with pale rose-lilac or rose-purple flowers 6 to 8 inches high, the petals strap-shaped and not quite an inch in width. The leaves produced in tufts are very strong, measuring 6 inches in width by a foot in length. The bulbs are also massive and, when fully developed, larger than a man's fist. The plants vary much, those from the Cilician Taurus are the best forms, being mainly rose-coloured and very large. It is a little too strong for the rock garden, but would prove useful for borders and naturalizing near water, where its bold foliage would be in harmony with waterside vegetation.

C. crociflorum (Crocus-bloomed Meadow S.) is a form of the variable *montanum* but a distinct garden plant, flowering with its slender leaf-growth in spring. It bears a tuft of white flowers 4 inches

high, the petals of which are striped with purple or rose externally. It flowers very freely and is one of the best spring-flowering kinds for the rock garden and should be grown in little colonies of twenty to fifty plants rather than in clumps of two or three. Several other *Colchicums* bear this name, forms of the Lebanon and common kinds in particular, but the purple stripe on the exterior of its petals identifies it.

C. Decaisnei (Decaisne's Meadow S.) is an exceedingly pretty kind from Palestine and Syria. It bears rose-pink, self-coloured flowers, darker in shade at the base, in shape like a Dutch Crocus, but scarcely so large. It flowers during winter and early spring, and the tapering, erect leaves of lustrous green appear shortly afterwards. This species is one of the choicest *Colchicums* for the rock garden, and, like *crociflorum*, should be planted in colonies for better effect.

C. Haussknechtii is a Persian species, the flowers of which are long-tubed, white or flesh-tinted, deepening to a pale purple with age; the leaves as in the native kind, but larger. A beautiful plant and a great rarity; a few specimens only are known.

C. latum, a native of Asia Minor, has long-tubed, chalice-shaped, self-coloured flowers of a pale rose-lilac colour, 8 inches or more long, flowering late in autumn. Flowering among its fellows in the rock garden at Kew, its soft colour and bold outline are very attractive. It is good alike for the rock garden or for borders, but should be given plenty of room.

C. libanoticum (Lebanon Meadow S.) is a small spring flowering kind from the Cilician Taurus and the mountains of Northern Palestine. Its flowers of pale rose colour appear in quantity with the leaves in February; they average 3 inches in diameter and have lance-shaped petals, which expand fully. It is a charming plant to grow in colonies in the rock garden in dry, warm places. This species scarcely differs, save in its larger flowers and stronger foliage, from the Mountain Meadow Saffron, of which it may be a far-eastern form.

C. montanum (Mountain Meadow S.).—A pretty rock garden plant widely distributed throughout South Europe and Asia Minor. Its forms are legion, they have star-shaped flowers less than 3 inches in diameter produced in quantity with the leaves and ranging in colour from white through all shades of pink, rose, and lilac to purple, each colour form being confined to a certain district or mountain. All the spring-flowering *Colchicums* which flower with their leaves fully developed are forms of *C. montanum*. It

may be grown well in any short poor turf, and is well suited for this use, its period of growth being shorter than in any other *Colchicum*.

C. Parkinsoni (Parkinson's Meadow S.), a native of Greece and the countries round, is a very distinct species of one of the few plants that flower freely and naturally during mid-winter. Its leaves are glaucous, prostrate, undulating and margined with white; the flowers are star-shaped, scarcely raised above the ground level, and their petals are lanceolate, pale purple, distinctly and prettily chequered with rich vinous purple. The flowers remain a long time in good condition, but a few days' sunshine robs them of their richly chequered tracery. It is an old-time garden plant, perhaps better known as *C. tessellatum*, a synonym of *C. variegatum* also. The star-shaped chequered *Colchicums* are usually natives of dry districts and require a warm situation in the rock garden.

C. Sibthorpi (Sibthorp's Meadow S.), a fine species recently introduced from Greece, has bold, chalice-shaped flowers 7 to 8 inches long, coloured a bright rosy purple, yellowish within, and with both surfaces irregularly chequered deep rose. The flowers expand fully, but owing to the breadth of petal never become star-like in outline as in the other chequered species. It is very free flowering. The leaves are glaucous, broad and flat. The plant grows well in the rock garden or warm border, and when in quantity should prove a useful species for the wild garden.

C. speciosum (showy Meadow Saffron) is a variable but exceptionally fine species from Asia Minor. It is vigorous, free flowering, and easy to establish; equally as well adapted for choice border and rock garden planting as for naturalising, attaining its fullest size in a rich moist soil fully exposed to the sun. The flowers are chalice-shaped, self-coloured,

varying from rose to purple, invariably paler in the lower half, and the petals being broad and stout give the flowers a very regular and finished look, such as one sees in a perfect border Tulip. It is the best and finest of *Colchicums* available in quantity, and should be widely planted.

C. album, a pure white variety of garden origin, of which a fine clump is growing in the gardens at Dalhousie Castle, Midlothian, is a great rarity and a valuable plant, of which a few examples only are known.

C. Tenorei (Tenore's Meadow S.).—A small flowered species, of rosy-purple tint, 4 to 6 inches high, the flowers of which are star-shaped and produced in early winter; it requires a dry warm spot under a projecting ledge of stone, as its flowers appear at a season when they have few chances of full development. It should be planted in colonies of a score or so to be very effective, as the plant does not increase rapidly.

C. variegatum closely resembles Parkinson's kind in its flowers, but the colour is rosy, chequered a richer rose, and they appear in autumn; the leaves are smaller, deep green in colour, and not prostrate. It is good alike for planting on the rock-garden and for naturalising in grass, thriving in sunny places.

The bulbs and seeds of *Colchicums* contain a narcotico-acrid poison, and children should be cautioned not to taste the fruits. No harm can accrue from handling the plants with ordinary care. Domestic animals instinctively avoid them.

GEO. B. MALLETT.

[NOTE.—The plant named *C. giganteum* in our drawing has lately come into cultivation under this name in several nurseries, and is a fine large kind, but what affinity it has to others previously known we cannot at present tell.—EDITOR.]

THE FARM IN THE LANDSCAPE.—Will treatment with a view to profit discard, of necessity, all considerations of tasteful arrangement? I think not, and for reasons among which I may adduce the following: Judicious location of a farm-steading, with a view to profit simply, will be always near the centre of the lands farmed. The ricks, the chimney, the barn-roofs, the dove-cots form a charming nucleus for any stretch of fields. If there be a stream whose power for mechanical purposes can be made available, economy dictates the placing of the farm buildings near to its banks: taste does the same. If such slope has its rocky fastness, incapable of tillage, and of little value for pasture, economy will suggest that it be allowed to develop its own growth of forest: a just landscape taste will suggest the same. If there be a broad stretch of meadow or of marsh land,

subject to occasional overflow, or by the necessity of its position not capable of thorough drainage, good farming will demand that it be kept in grass: good landscape gardening will do the same. Again, rolling hillsides, which are not readily subject to any course of tillage, will be kept in pasture, and will have their little modicum of shade. The good farmer will be desirous of establishing this shade around the brooklet or the spring which waters his herd, or as a sheltering belt to the northward and westward of his lands: the landscape gardener cannot surely object to this. Declivities are to be overcome by the easiest practicable grades, and the curves which will insure this in most landscapes are those which are justified at a glance by the economic eye, as well as by the eye of taste.—D. G. MITCHELL.

SIDELIGHTS ON THINGS JAPANESE.

ONE of the most striking changes in British gardening of late has been the delight with which we have welcomed the flora of Japan and China. In this welcome the art treasures of both countries have shared more and more, although, as a fact, these were highly valued by connoisseurs long before much interest was

tion in Europe, and their very variable races of Lilies, Maples, Chrysanthemums, Adonis, Anemone (Hepatica) Psilotum, Iris, Hemerocallis, Nandina, were originated centuries ago. All the Japanese arts were originally imported from China, as also were many of the cultivated plants now so popular in Japan. But the



ONE OF THE ROSY DOUBLE CHERRIES OF JAPAN.

taken in Japanese vegetation. The gardening and botanical literature of China and Japan goes back much further than our own, and their modern works are well worthy of special study. No doubt hybridisation and cross-breeding in both countries were effected long ere they found anything like general adop-

Japanese, like most other isolated people, developed both their art and plant cultivation along distinct lines of their own. When Fortune first visited China about 1843 he took out with him some of our best florists' flowers, and was surprised that they seemed to value nothing he took with him except scarlet Zonal

Pelargoniums ! The Japanese were but little more sympathetic, probably because they had so many lovely flowers of their own, and, what is more, so much of sentiment and conventional or legendary lore bound up with them and the seasons at which they naturally bloom. Their love of flowering trees and shrubs is well known, and the introduction of their Crabs, Cherries, Magnolias, Wistarias, Plums, and Vines, to say naught of many other choice garden flowers, has given a greater impetus to the planting of flowering trees, shrubs, and climbers in British gardens than any other event of our time. Even Japanese fruits, such as the Plum and the Kaki, are already becoming of much economic interest in California and elsewhere in the warmer United States, in South Africa, Italy, and the South of France. The introduction of the Japanese Chrysanthemum by Fortune, as we all know, led to a great change in the cultivation of that popular flower in our home gardens.

To-day the Bamboo garden affords another instance of how Japan has helped us in our gardens, and there is reason to believe that these woody-stemmed grasses have been hybridised in that country, but whether as wild, or as cultivated in gardens we do not at present know. Take, again, the varieties and forms of the Japanese Maple, and one or two other species, their variation is surprisingly rich, and, so far, we are at a loss to know whether their origin is mainly from seed as wind-fertilised, or whether the custom of grafting, or rather inarching, has not helped in their production.

As to Cherries and Plums, their name is legion, and the beautiful double-flowered kinds of these are probably of garden origin. The same remark applies to many Lilies, tree Pæonies, and especially to the artificial rearing of seedling *Iris Kämpferi* so-called, which are believed to have all come from the purple *I. lævigata* of Siberia. Siebold's Primrose, again, is no doubt a garden development of the Siberian and Chinese *Primula cortusoides*, both having reached Japan, *viâ* China, long ago.

Kämpfer was a German physician, who originally appointed to Batavia, went thence to Japan, like Thunberg and Siebold, with

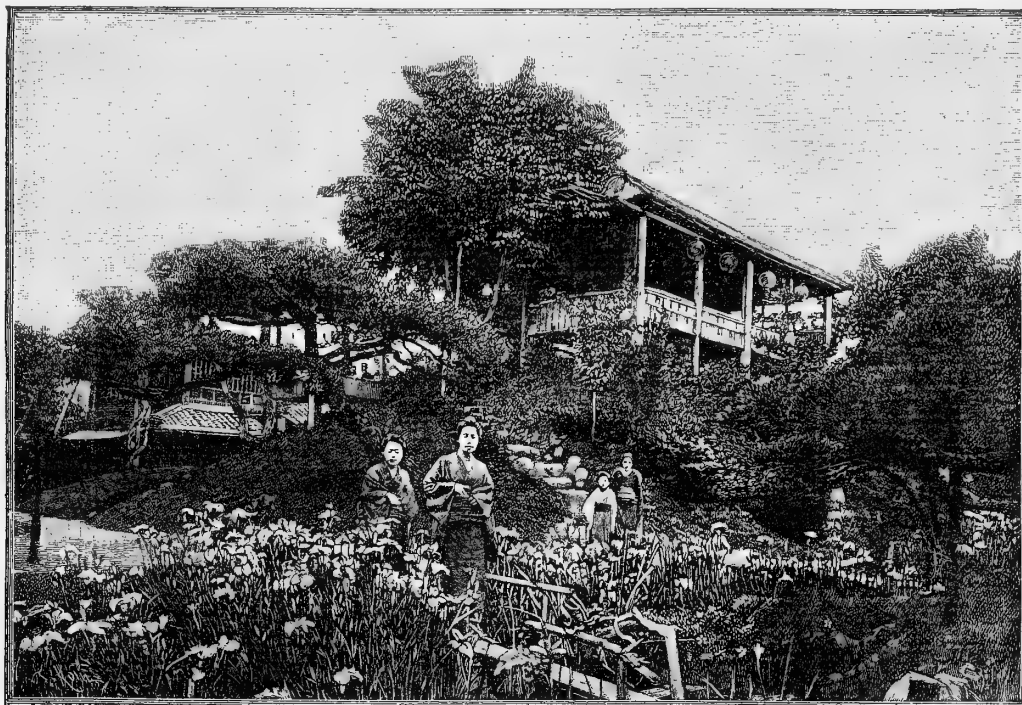
the yearly embassies of the old Dutch East India Company. His "History of Japan" was published in England after his death from a MS. acquired by Sir Hans Sloane. It may be seen at Kew, or in the library of the British Museum (Natural History Department) under the title of "Icones Selectæ Plantarum," and is dated 1791.

Prunus mume (or Plum), to which reference is made in FLORA AND SYLVA, No. 1, p. 7, was figured and described by Siebold in his "Flora Japonica" sixty years or so ago. Siebold says that it is a yellow-fruited Plum used in Japan for pickles, like our cucumbers, and producing *many hundreds of varieties*. It is also used by the Japanese gardeners for dwarfing as domestic ornaments indoors. "The Japanese," says Siebold, "have an incredible fondness for dwarf trees, and with reference to this the cultivation of the Mume is one of the most general and lucrative employments of the country. Such plants are increased by inarching, and by this means specimens are obtained which have the peculiar habit of the Weeping Willow. A nurseryman offered me for sale, in 1826, a plant in flower which was scarcely 3 inches high; this *chef d'œuvre* of gardening was grown in a little lacquered box of three tiers, similar to those filled with drugs, which the Japanese carry in their belts. In the upper tier was this Mume, in the second row a little Spruce Fir, and in the lowest a Bamboo scarcely an inch and a half high."

Siebold was one of the first garden-botanists, and an excellent little biography of him may be found at p. 474 of Veitch's "Manual of the Coniferæ." He returned to Europe in 1830 and published his now celebrated "Flora"; about the year 1850 he settled at Leyden and established a nursery or *jardin d'acclimatation* for Japanese plants. As late as 1883 this nursery, with its curved, ridged, tile-roofed entrance, and offices, its tori, and jungle of Japanese plants, all neglected and running riot, was in existence. Myself and Mr. Peter Barr together made a pilgrimage to the place and entered, finding no one in charge. It was in early May, and many Japanese plants, since introduced over again, were growing there. Messrs. Veitch, Maries, and Wilson, and amateurs like Lord Redesdale, Mr. and Mrs.

Ernest Hart, and others, had not then arisen in their enthusiasm and strength, nor had our friend Mr. Eida then settled in London. We saw in the old Japanese nursery at Leyden evidence, ample and varied, that Siebold had been a most remarkable man. It is believed that he introduced the beautiful *Vitis Thunbergi*, which the late Anthony Waterer, of Knaphill, found growing in a nursery at Boskoop and introduced, and grew for years over Laburnums and Scotch Firs in his nursery. This noble Vine is now believed to be quite distinct from its first-cousin *V. Coignetiae*, a later introduction. One of the first to fully appreciate the beauty of Thunberg's Vine was Lord

When Peter Barr and myself were at Leyden we saw evidence of Siebold having introduced some examples of dwarfed Japanese trees. At that time dwarfed trees appear to have been a drug in the market, and they had been—probably to save trouble and attention—plunged outside in their original pots, pans, and vases, and, rooting through into the rich alluvial soil outside, had thrown out great growths and branches from the contorted network of interlaced or gnarled growths below. Coloured and cut leaved Maples, *Rodgeria*, and giant *Polygonatum*s also were there, unkempt and luxuriant; so, also, the giant Knot-weeds *Polygonum Sieboldi*, *P. compacta*, and *P.*



IN AN IRIS GARDEN, JAPAN.

Annesley, who has grown it in Ireland for thirty years or so. I have seen this Vine very beautiful at Castlewellan, but a rooted layer of it presented by Lord Annesley to his old friend the late Major Hall, at Narrowwater Park, is now probably the finest specimen in existence in the British Isles. The late Charles Maries, Professor Sargent of the Arnold Arboretum, and other travellers, have all told us of the autumn glory of this Vine, as seen in the woods of Japan; and, after that of Thunberg, it is one of the best of the large-leaved grape vines now grown.

sachalinense, the latter trying its best to choke up everything amongst which its great suckering stems ran about, like a big bully of a boy at play. Neglected as was Siebold's old garden, we left it with regret, and took a long, lingering look at the little tiled roofs and the torii, and felt in our hearts that we had trodden on sacred ground, for the soil is really consecrated that has been cultivated and stocked with beauty by the hands and once living, throbbing brain of a man of Siebold's character. I believe the financial success was very small—possibly, from an accountant's view, an actual

loss—still the man himself must have reaped much as he laboured there, and as his thoughts went back to his days in Japan, where he had been so popular as a western “medicine man” as well as a botanist. Even Holland, the land of bulbs and of tree and shrub culture, owes a heavy debt to the man who brought his curiosities to their museums, and his rare plants to their nurseries and gardens. Like many others, however, Siebold was ahead of his time.

“Things Japanese” were not in the ascendant sixty or seventy years ago as they are to-day. We do not know for certain whether Siebold was influenced in his travels and studies by the writings of Kämpfer and of Carl Peter Thunberg, a Swede and pupil of Linnæus, who, after adventures at the Cape and in Java, spent five years at Yedo and Nagasaki and published his “*Flora Japonica*” (note the same title) in 1784. Thunberg was in England, prior to his return to Sweden, in 1779, where he saw Dr. Solander, Sir Joseph Banks, and many other botanists and gardeners. His country elected him as successor to Linnæus as demonstrator of botany in the University at Upsala, and he died in 1828. It does not appear to be generally known to present day lovers of plants Japanese that Thunberg wrote some “*Observations of the Flora of Japan*,” which were published in the “*Transactions of the Linnæan Society of London*,” and which are worth the attention of those who may not hitherto have seen them. Kämpfer (1651-1716), Thunberg (1743-1828), and Siebold (1796-1866), by their works and in collecting specimens and in their writings, were the pioneers of Japanese botany, and no doubt the results of their travels influenced more modern travellers and collectors in China and Japan. Men like Fortune, John Gould Veitch, Maries, and Wilson continued, and, in the last case mentioned, are still continuing, the work of exploration which these three men began.

The latest phase of British gardening (if we except the moraine bed for Alpine plants) is the present fashion of making what are termed “Japanese Gardens” under an English sky. It is yet too early to prophesy as to the fitness or the beauty of these, and, like the pleached alley, the maze, or the pergola, they must run the gauntlet of time and public opinion. In any case such gardens are to be seen at Holland House, Kensington; and at Gunnersbury House, Acton, W. There is certainly a charm about them, and they are interesting, bringing together, as they do, not only Japanese plants of all the best kinds, but stone lanterns, bronze urns, and figures of animals such as storks and lizards, bamboo bridges over watery pools or canals, with winding paths of stepping stones wandering “there and back,” through masses of Iris, Lilies, Rhaps, Bamboos, Chusan Palms, and other beautiful things.

Not alone have we progressed in our knowledge of Japan during recent years, but the nurserymen and trade gardeners in Japan, at Yokohama and elsewhere, are now eager to meet us half-way while Japanese botanists and other of their students now graduate at our English Universities; and, as I have before said, Japan sends her experts in the cultivation and importation of dwarfed trees, and in the selection of Japanese fabrics, pottery, furniture, and old arms and armour, to settle in London and educate our Western taste in the matter of their beautiful Eastern things.

Some of these new Japanese gardens are far from artistic or from being Japanese, and we believe that they cannot be successfully done except by those who know Japan. Mr. Alfred Parsons, who has travelled much there, tells us that what they do in gardens is bound up with their history, geography, and literature, and other things, unknown to most who have formed such gardens here.

F. W. BURBIDGE.

THE CULTURE OF MARIPOSA LILIES.

OF all the plants that live in the open air of our country there are none more fascinating than these. The climate of Greece or of Southern Italy is scarcely so good as that of the Pacific region in which these flowers grow; and while to that region belong, perhaps, the most lovely evergreen woods known on the western side of the mountains, much of Arizona and the Rocky Mountains is more arid than any part of Southern Europe. Yet through this mighty region, stretching from British America through the Rocky Mountains down to Mexico, these fragile-looking and beautiful plants abound. I know of no other group of plants that on first acquaintance so quickly charm and interest all flower lovers. From my boyhood they have always fascinated me. I well remember frames full of the beautiful early-introduced kinds growing in my father's garden some twenty years ago. Happily they are hardy, and any protection we give them should be rather to save them from wet than from frost. Many new additions have been made to the family of late years, and the best of all the known forms are now in cultivation.

The Eldorado strain, as it is called, introduced about 1895, is a great gain; it is supposed to belong to the Venus-tus group, but it seems distinct. It comprises a number of tall, vigorous-growing forms, varying greatly in colour, from white to lilac and deep purple, and from pink to deep red, all

most beautifully blotched and marked, and some with gold blotches or stains on the upper edges of the petals. The introducer of this fine race once wrote me that he had been on the mountain slopes surrounded on all sides by masses of them in flower, the stems being fully 3 feet high. What a sight it must have been! Whenever I look at my own beds in full flower in the summer I long to be transported to their native land, where one may see them in myriads in their full beauty. I have often listened with envy to the description given by an enthusiastic amateur gardener, of how he drove (when in California) for a whole day over a district which was full of *Calochorti* in flower.

Culture.—The conditions under which these lovely bulbs may be successfully grown are what we are all anxious to learn. First, we must bear in mind that, in their own home, soon after the flowering season they go to rest, and are completely dried up owing to great heat and drought; then comes the winter with snow and frost, keeping them still imprisoned, and then the spring—the lovely and genial Pacific Coast spring. And here it may be noted that if the growing season be wet the plants will be more vigorous and the flowers more abundant. The principal difficulty that we have to contend with is the large amount of rain that falls in the winter months. Past experience has shown that *Calochorti* are not plants for the ordinary mixed border. They require a small spot to

themselves, where they can be given all they need, and such a spot may be found in nearly every garden. In a sunny corner let a raised bed be formed some 6 to 10 inches higher than the surrounding surface, the sides supported by wood or stone (a vine-border makes a capital site without any further raising); the soil composed of leaf mould, sandy road-grit, and ordinary light border soil, to which some fibrous loam may be added. We have found of late years that rather heavier soil than was originally used is beneficial, as it does not get too hot and dry in the summer.

Plant the bulbs in October–November, about 3 inches deep and 3 inches apart; when planted cover the bed with reeds, bracken, or similar material. This throws off the heavy rains and keeps the soil open; but, remember, the covering is not so much meant to exclude frost as cold rains, so do not use too much of it. Should it be very wet and rain fall persistently, place a light over the bed. Another method of cultivation is to plant the bulbs in a frame, and, where frames are to spare,

nothing is simpler or better; the light is raised at each end, so that there is plenty of fresh air, and, at the same time, all rain is excluded. Remove all covering from the beds early in February, when the bulbs should be well advanced in growth. As they pass out of flower remove all flower-stems, as, if left, they quickly seed, and, ripening on the plant, weakens the growth. Place a light over the bed towards the end of July and thoroughly rest and ripen the bulbs; the bulbs may later on be lifted, stored in a dry place and planted again in November.

Apart from the foregoing suggestions, the dwarf forms and Star Tulips are admirably suited for planting in the rock garden on sunny ledges in small groups. Of their value as garden plants in this country, when well grown, one cannot speak too highly.

These notes are not to be taken in any sense as complete, and I hope my readers will pardon any shortcomings they may find in them.

ROBERT WALLACE,
Colchester.

THE WEASEL THE GARDENER'S FRIEND.—Of all people in the land gardeners have most reason to protect the weasel. They have not one single word of complaint against it, not even for disturbing the soil of the flower-beds. Having no game to encourage, they may safely say to it, "Come hither, little benefactor; take up thy abode amongst us. We will give shelter to thy young ones and protection to thyself, and we shall always be glad to see thee." And fortunate, indeed, are those horticultural inclosures which can boast the presence of a weasel; for neither mouse, nor rat, nor mole can carry on their projects with impunity whilst the

weasel stands sentinel over the garden-ordinary, and of little cost are the apartments required for it. A cart-load of rough stones heaped up in some sequestered corner free from dogs, will be all that it wants for a safe retreat and a pleasant dwelling. Although the weasel generally hunts for food during the night, it is by no means indolent in the daytime if not harassed by dogs or terrified by the report of guns. Whilst all is still around you, it may be seen coming out of a hole in the ground, with its head particularly erect at the time, and it starts and stops at intervals as though afraid to advance. —CHARLES WATERTON.

EVERGREEN COVERT.

THERE is a shrub in bloom in the country round London now which is very beautiful as an evergreen covert plant, being hardy in winter, fine in colour, and of vigorous constitution. It is "Cunningham's White," an old *Rhododendron* which, although called white, is a rosy-lilac colour in bud. It is one of the best plants we know for growing in any cold, or rough, or even clay soil, forming excellent covert—far better, we think, than the pontic *Rhododendron*, and having also the advantage that it can be bought on its natural root in some nurseries in the Midland counties. It is easily increased, and grows in any soil. I have had a group of it in good health in clay (part of a dug-out foundation of a building) for over a dozen years; it never turns a leaf in any frost and is a close and excellent covert. There is nothing on which more loose talk is indulged than on the matter of covert plants. One famous sportsman tells people to put Privet where they want covert near water—a most weedy and evil-smelling shrub, besides being bad covert, its rapid growth being its only recommendation. It is a mistake to use a weedy bush merely because it grows quickly. Most hardy shrubs grow quick enough, and some of the most rampant growths are the soonest to go back. On the whole, the best covert plant, especially for woods near the house, are the native and other hardy evergreens. In the choice of such plants, their beauty should not be overlooked, and things of offensive odour and other bad qualities like the Privet should be rejected. *Rhododendrons* are often planted, but it is the common pontic kind, which, used as a stock, ends by killing the good kinds grafted on it. If, however, we take to layering our brilliant kinds of hardy *Rhododendrons*, then we shall have such underwood beauty as no garden can rival. It is not necessary to put the finer and hardier *Rhododendrons*, raised mostly from the hardy North American kinds, on the somewhat tender *ponticum*, and, if nurserymen will not layer them, everyone who has a good kind should layer it for himself wherever the plant grows. Some of the best nurseries now have already good stocks of the finer kinds on their own roots, and are preparing more. These in cool woods would almost layer

themselves, and give a splendour of colour in summer that no man's planting could surpass.

Box.—No more useful evergreen covert than this exists for chalky and light soils, growing where it would be hard to establish covert from foreign shrubs. Few who only see Box weary and drawn in the shrubbery have any idea of its beauty massed on an open down. As an evergreen group on a hot and poor bluff in a wood it would be fine in effect and an excellent and warm covert. Happily, this native evergreen loves our poorest and driest soils, of which there is such a vast area in the southern counties. Box will thrive on chalky wastes where no other shrub or tree appears, and, most fortunately, there is something distasteful in it to rabbits, which enables it to be let alone in places most infested by them.

THE EVERGREEN BARBERRY (*Berberis Aquifolium*).—This is a very pretty shrub and a good, free grower in many peaty, open soils, but seems to stick and do nothing in certain heavy soils. As, however, these occur in certain parts of the country only, it may be included among the very best shrubs for green covert where it grows freely. There are various forms of the plant, which is widely distributed along the Pacific Coast of America, and it is important not to get small growing forms.

THE "SWEET BAY," OR TRUE LAUREL (*Laurus nobilis*).—I had never seen this used as covert, but having many bushes of it to spare I tried it in old woodland, and was pleased to see how well it did and how well it looked, being much more dense in growth than the common or Cherry Laurel. It is also very cheery in colour in the winter season and not so rampant, and it increases very freely when pulled to pieces. It is easy to be had in southern nurseries, and should be used only in southern and seashore districts where it thrives so well. Even if not generally used as covert it can be made to form very pretty groups in woods.

FURZE.—This is among the best and the most easily raised of all evergreen covert plants. In new plantations, where we wire to keep out rabbits, it is a good plan to scatter the seed of

Furze, which gives excellent cover, and not in the least interferes with the Larch and Pines. It is not only the common Furze, which is attractive in so many places throughout the United Kingdom; we may use three other kinds, namely, the little autumn-flowering Furze, and what the French call the Foxbrush Furze—a fine tall Furze of excellent growth and plummy habit, which makes it useful for faggots where these are wanted, as they often are in farm and garden. The little Furze (*Ulex Gallii*), again, is quite distinct from either of the above, flowering in the autumn. It grows in abundance on many of our moors, yet is hardly ever planted by design, although a most important plant for all who care for low foregrounds. It may be planted, but the best way is to sow it in May in any bare or recently broken ground.

HOLLY.—Though often a tree, Holly is an excellent covert, and, in some free or gritty soils, even runs at the root, as in certain parts of Epping. It loves poor, stony ground, and, mixed with Juniper, forms beautiful covert; but only seedlings of the wild form should be planted, and in establishing colonies of Hollies in rabbit-infested ground it is necessary to wire, and wire well.

JUNIPER.—Our native kind is meant here; it makes very good covert for some poor dry and chalky soils, too frequent in the southern half of the country. Junipers can be had from various parts of the world, but that our own native Juniper should be as worthy of cultivation as any has rarely occurred to our planters, though we have so few really hardy evergreens. On the hills of Surrey it grows to a height of 18 to 24 feet, though usually only a bush. It can either be raised from seed or small plants of it purchased from forest nurseries.

SAVIN (*Juniperus sabina*).—This is one of the most graceful and hardy of all dwarf evergreens, and admirable for cold hills or stony ground—no matter how wet or poor. It is a dwarf Juniper that clothes those parts of the mountains of central Europe which are too hungry to support anything larger. Where not easily bought in quantity it can be readily increased by pulling up the branches, which often throw out many rootlets. These should be planted firmly and a stone put over the part

left out of the ground, or it can be pegged down to stop windwaving.

IVY.—This is under-valued for its use and beauty in woods and is too often cut away. It would be well in many places where the large-leaved Ivies are grown to put them here and there in copses. They are of all things the most easy to increase, the young shoots pulled off wall or tree rapidly rooting in moist earth. The Ivy we must put among our best native evergreens, as, after carpeting the wood and clothing the tree stems, when it gets to the crest of an old Juniper or other tree, it takes the tree form, and then is as good an evergreen as any.

THE GREAT PARTRIDGE BERRY.—A valuable covert bush, but very difficult to buy in any quantity in nurseries, though quite a free-grower. It is very good at Coolhurst. It has been neglected by nurserymen, owing probably to the small demand for it for gardens. It will thrive in ordinary soil, and runs about apace in wet peaty places. In Scotland it seems to be better known than in the south, for it has been largely planted there for covert, as at Balmoral. It is one of the few shrubs that will thrive in the shade of Pine plantations.

THE CHERRY AND PORTUGAL LAURELS.—The Cherry Laurel (usually but wrongly called the Laurel) is, perhaps, more used than any other bush, but has certain defects, being not hardy in severe winters even in Ireland; also, it is too vigorous for underwood covert, and when chopped back, as it very frequently has to be, it is ugly. As to its hardiness, however, some of the newer forms are hardy, especially that from the Shipka Pass; and, in regard to its beauty, it is best seen in a wood allowed to grow in its own natural way. In some southern and mild districts the Portugal Laurel and some of its handsome forms are very free-growing evergreens, but in cold and inland districts they are apt to be cut down in hard winters. They are so free and handsome in the south and west, however, that they may be used with good effect now and then.

YEW.—Yew grows well in the shade and gives warm covert, but should only be put in the inside of woods owing to its poisonous nature, and the woods should be fenced or much trouble may arise from stock eating it.

It is common, however, being naturally sown in some districts and cannot be excluded from our plantings, and the safest way with it, perhaps, is to put it in a dense group towards the centre of a wood, where its shelter will be very welcome to birds in winter.

THE PALMATE BAMBOO (*Bambusa palmata*).—There is often good natural covert by the side of water, natural covert being often the best and least troublesome to establish; but in the many places where water comes near, some may desire a more varied and evergreen covert, and for this end I never had such success with any plant as the above-named graceful, vigorous, and truly evergreen Bamboo.

I first had it in a moist wood in rather black soil, and then took a fancy to moving it to the waterside in ordinary heavy and cool soil. It did well in it; but, although we took the plant out carefully from the wood, a number of roots remained, and from these arose the most graceful colony of plants I ever saw, so fresh and fine a green in the middle of winter as almost to make one forget the season; the shoots are handsome enough to cut for

the house in winter, the growth close, and the form beautiful. It was quite free by the waterside, where its fine reed-like habit is the very thing we want to go with Reeds and Willows. This plant is, perhaps, not yet easy to secure in the quantity likely to be wanted as covert, but it is so vigorous a grower and free at the root that there cannot be much difficulty in getting a stock. My plants are 6 to 8 feet high; with Lord Redesdale it grows higher. For covert it must usually be in the natural soil of a place, and the normal growth is best.

THE JAPANESE BAMBOO (*B. Métaké*).—This is an older and better known plant than *B. palmata*, and very free and hardy in varied conditions. It grows somewhat taller, but is a fine covert plant where a growth of a larger sort is desired. It has long been cultivated in Surrey nurseries and is easy to secure; it increases quite freely either in woodland or near water. Some of the older Bamboos, such as used to be grown first of all as *B. falcata* so well in the south of Ireland, at Fota, give tall covert of a graceful sort, but not so good as these.

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DAVID CANNON ON INTRODUCED FOREST TREES.

MR. DAVID CANNON is an Englishman who has made his home in the Sologne, which is a cold part of France, where he has made some instructive and important experiments in planting, the results of which he related in a paper that was read before the Society of Agriculture of France in 1900, and has been kindly revised by the author for FLORA AND SYLVIA:—

“My soil is naturally very poor, and the climate of Sologne is much given to extremes of heat in summer and cold in winter, with frosts more or less severe from September to May: my experiments are consequently confined to the most hardy kinds. The man who can succeed at Vaux will be successful in any silicious,* even poor, soil, provided it has a little moisture. Sandy soils, when not too much parched by the heat, are favourable to the growth of conifers. The height measurements were taken with a Goullier disimeter, and the girths were measured about 4 feet from the ground. Those measurements were taken last March, and for this year's (1900) growth should be added another $1\frac{1}{2}$ to 3 feet to the height, and to the measurements round the stem a little less or a little more than an inch, according to the vigour of the species.

“THE COLORADO SILVER FIR (*Abies concolor*, var. *lasiocarpa*).—Its area extends over the Rocky Moun-

tains from Colorado to North California. It is a robust and remarkably handsome tree, with the large leaves silvery on both sides. Its growth continues late in the season, and it seldom suffers from spring frosts. In America its height is colossal, and in some favourable soils reaches to about 250 feet. Most of those of my own planting I have found slow growers. One isolated tree, planted in 1889 in poor dry soil, is still little more than 14 feet high, and less than a foot in circumference. The best specimens in a younger clump are not above 6 feet 6 inches; now, however, they are more at home, and they promise to shoot up.

“THE ‘PUGIT SOUND’ FIR (*Abies grandis*).—A gigantic Fir of North-Western America, producing an immense amount of excellent wood. It should, therefore, be a very important gain could we succeed in acclimatising it as a forest tree. It much resembles our Silver Fir but for its larger foliage, and of all the species of the family it appears to be the slowest at starting. It is of quite recent cultivation at Vaux; the plants are easily grown in the nursery; one specimen amongst others has shoots over 2 feet already. It appears to suffer from the heat of the sun, and perhaps in the south it would require protection.

* I understand “silicious” to comprise sandy, sand-stone or granite soils; in fact, all that are not clay or limestone.

"THE COLUMBIA SILVER FIR (*Abies nobilis*) is found all over Northern California and Oregon, where it grows some 260 feet high, and justifies its name by its superb appearance. The leaves, which are erect upon the branches, turn their glaucous-green undersides to the sun, so that the silvery tones of the tree almost equal those of *concolor*. With me, so far, it shows little sign of development in close plantation; possibly it awaits at leisure the moment to shoot up. An isolated specimen, somewhat sheltered, however, by adjacent plantations, and aged between thirteen and fourteen years, is nearly 20 feet high and 16 inches in girth. Last year it put out a 28-inch shoot.

"THE RUSSIAN SILVER FIR (*Abies Nordmanniana*).—Native of the Caucasus, and one of the handsomest of conifers, it is too well known to need description. It is as slow to develop in its first years as its pectinate relative, and starts later in the spring. It is seldom hurt by frosts, a fact which enables us to dispense with shelter in its case. Planted close in 1889, it is now over 14 feet high and about 8 inches in girth. It is one of the chief forest trees of South-East Russia. Its wood, when matured, is of superior quality, and as it endures the heat better than the common Fir, it might well take the place of the latter in some central and southern localities.

"To sum up, these silver-foliaged Firs, though of slow growth at first, seem to do as well as could be expected, and are beginning to shoot up, giving promise of fine vegetation in our cool soils. Only in exceptional cases have they suffered from the spring frosts, although the severe weather of May 1897 (when already well in vegetation), followed by some days of hot sun, sorely tried them, and their growth was retarded; but the same happened to many of the common species, which are usually proof against such attacks.

"THE ANDALUSIAN FIR (*Abies pinsapo*) is also a native of Kabylie, and seems to be at home on the limestone slopes of the Loire. It accommodates itself also to our sandy soils, and is not afraid of a warm exposure. Two isolated specimens of mine are very stout trees about 16 feet high. Some younger specimens, closely planted, are not more than 6½ or 9½ feet, but these have already put out some strong and lengthy leading shoots. The wood of the *pinsapo* resembles in all respects (according to Mathieu) that of the common Fir.

"THE TREBIZONDE SPRUCE (*Abies orientalis*) is very hardy in our cool soil. It closely resembles the common Spruce, with smaller leaves, growing closer round the branchlets. Its hue is deep green, and its habit graceful. Its wood is of high quality, elastic and durable, but it grows slowly, and could only be raised in rows with quick-growing nursing, though in the Caucasus region it forms an important part

of the forest, sometimes attaining a height of 160 feet.

"THE SITKA SPRUCE (*Abies sitchensis*) is, perhaps, with the Douglas Fir, the most valuable importation for woodland cultivation we have from North-West America. It is of robust habit, forming a broad pyramid with silvery and very prickly foliage, thickly set round the branches like that of the *pinsapo*. Some isolated specimens have not succeeded at Vaux, having suffered from the droughts and heats of our summers; but, planted close in lines, they are doing well. The species is not exacting, given a cool and light soil. It stands moisture better than drought, and in our warm, sandy, and gravelly soils the vegetation is wretched. Grown in a cool heath soil some plants are doing very well.

"THE DOUGLAS FIR (*Abies Douglasii*) is, so far with us and everywhere, I believe, a triumph of exotic conifer acclimatisation. Some isolated specimens planted at Vaux are examples of remarkable rapidity in growth. One specimen which I planted in 1875 on a most ungrateful sand, where it has never been possible to grow the least turf, is at the present time 43 feet high and some 4 feet 6 inches in girth. It has grown up under rather singular conditions. Every four or five years its leader—which in this specimen is long, thick, and sappy—was broken off, owing to the magpies alighting on it; and on each such occasion a side branch took its place. After a sloping growth of a year or two the branch took a vertical direction, so that the tree continues straight; and each successive breaking off of the leader, without much lessening the height of the tree, has added to its girth and spreading habit. Wherever it is planted amongst other Firs the Douglas is *facile princeps*. Its culture cannot be too strongly recommended, especially to owners of soils that are at all cool, provided the proportion of limestone in such soils is not excessive, limestone soils being unsuited to it.

"PRINCE ALBERT'S FIR (*Abies Mertensiana*).—This species is nearly allied to *canadensis*, or the Hemlock Spruce, but its growth is more vigorous and its wood of better quality. The shoots of the young plants are, perhaps, more sensitive to spring frost. A line of these Firs planted as a border to a mixed wood of Oak and Pine (a condition unfavourable to their vegetation) held out bravely for a time; most of the trees, however, subsequently fell victims to the extreme heat and drought of the summers of 1900, the Pines absorbing the little moisture the soil contained.

"ATLANTIC CEDAR (*Cedrus atlantica*).—Manetti is considered to be a variety of *C. Libani*, but nevertheless differs from it in its more erect habit and the greater slenderness of its branches. Its growth at Vaux is rapid, and it promises to be very hardy, even planted in poor soil. The Cedars are hardy and

vigorous in poor limestone soils. I have seen some young specimens doing very well with my colleague, M. Maistre, in the limestone and barren lands of Hérault, where the Pines make but a mediocre display. The wood is excellent and of great durability within their natural areas.

“LAWSON’S CYPRESS (*Cupressus Lawsoniana*).—In Sologne it promises to make an admirable ornamental tree, with its delicate branches, elegant and pyramidal, somewhat spreading form and fine green colour, which it retains during the winter. Like other Cypresses, it has this peculiarity, that the young stem often divides from the collar into several. This, generally, is of little importance, as later on the middle stem gains the mastery over the others, which then become mere side branches. The wood is of fine quality, delicate, and compact.

“THE RED CEDAR (*Juniperus virginiana*).—In 1891 I planted it alternately with *Thuja gigantea*. Its growth has been inferior to that of its associate, being less than 13 feet, but at the present time it has begun to shoot up. The tree is, however, one of only second-rate size, seldom rising more than 49 or 50 feet; but it is to be recommended for the fine quality of its wood, which is useful in certain delicate parts of cabinet and other work, and notably in the manufacture of pencils.

“THE YELLOW CEDAR (*Libocedrus decurrens*).—This is a superb tree, and in California and Oregon grows to a height of between 98 and 115 feet. The stem is very thick, but the branches are short and slender, and the form of the tree is elegant. I have an isolated specimen in my park which was planted in 1870; its height is about 62 feet and its girth about 5 feet. In the clumps planted in 1889 its height varies between 13 and 15 feet. But for the attacks of rabbits (which are particularly fond of this species) it would doubtless have shown a finer growth. It promises even now to make up for lost time. Its delicately grained wood is excellent for some building purposes.

“THE AMERICAN PITCH-PINE (*Pinus rigida*).—A tree of very slow growth. We have only some poor specimens of it at Barres, though in the sands at Vaux it does very well. Fourteen years ago, with the intention of forming a nursery in a small area of waste land, I had the ground cleared by burning the Heather. The fire having broken bounds, overran and burned up 1¼ acres of fallow sandy land beyond, which had been completely exhausted by bad farming. The burning of the heath sods imparted an ephemeral fertility to the soil, and for three years I used it as a nursery for the hardiest kinds of plants. In the last of these years we planted half an acre of this land with *P. rigida*, one-year-old plants, and the following year, when removing the crop, I left enough of the young trees to form a permanent

plantation. These Pines, aged now between eleven and twelve years, average about 16 feet high with a circumference of 11 to 12 inches. The plantation having been properly thinned, the result is a good upright growth, contrary to the reputation of these trees for a knotty and bushy habit, a reputation which is probably owing to travellers having only seen it growing in a scattered state, in which its branches would gain disproportionate development, as happens to the common variety of *P. sylvestris* in open spaces. From my experience I should say that *P. rigida* might be of service for cultivation in lieu of the Maritime Pine in dry, poor soils, in plains, and on slopes distant from the sea coast where the Maritime species is decimated by the ring (ronde) disease, and suffers from too rigorous winters.

“THE WHITE PINE (*P. strobus*).—It was planted since the year 1870 in the moist, not to say boggy soil of the communal forest of Raon-l’Étape (Vosges). In 1890 it had grown to a remarkable height for its age, and the wood, which before had been used chiefly in the making of boxes—a purpose for which it was well suited as not being liable to split—was also found useful in paper making. One tree near my house, planted in 1872, is over 50 feet.

“The Forest Administration continues to plant the species in the Raon district, so I presume that its cultivation is remunerative. In Nièvre it is used for building purposes by my colleague M. de Saint Maur with satisfactory results. He finds that this Pine does well with light shade.

“I consider the success of young American conifers in rather sandy soils very encouraging, taking into account the slow growth during the first years, of the Silver Fir especially. At the present time the conifers at Vaux display a vigorous upward growth, and I believe that in another ten years the rate of increase will be much higher.

“SUMMER LEAFING TREES (*Negundo*).—This year, for the first time, I have planted the Californian *Negundo*, which, according to M. de Vilmorin, has showed extraordinarily quick growth at Eberswalde, as at Barres, and at eight years old is already between 39 and 40 feet high. This would be, so to speak, the Eucalyptus of temperate lands; it remains to be seen whether it is hardy enough to withstand our cold seasons.

“THE JACK OAK (*Quercus palustris*), despite its name, is as prosperous in growth in our dry sands as the other American Oaks. I have three isolated specimens of this tree which were planted 25 years ago, and are respectively 32½, 39½, and 35½ feet high, and 23½, 26, and 28 inches in girth. At the present time they throw out some fine head shoots. With their very erect growth (though inclined, almost drooping tops) they are regular-pyramidal in shape, somewhat spreading and covered with a foliage

which, being entirely red in autumn, has a superb effect. Planted on the borders of a wood of *sylvestris* Pine (unfortunately some years later than it), *palustris*, like other American Oaks similarly planted, gave less satisfactory results, as the Pine has taken possession and exhausted a soil which was never other than poor. We have, notwithstanding these unfavourable conditions, trees that measure $32\frac{1}{2}$ to $35\frac{1}{2}$ feet high, and $15\frac{1}{2}$ to $16\frac{1}{2}$ inches in girth, and show vigorous growth.

"THE SCARLET OAK (*Quercus coccinea*).—The same observations apply to this, which bears the handsomest foliage of any, its great cut leaf, brilliant red from the beginning of autumn, retaining throughout the winter a warm, reddish-brown tone. Planted as a fringe to woods of resinous species in a poor, dry soil, these Oaks are already 26 to $32\frac{1}{2}$ feet high, and promise to do well.

"THE RED OAK (*Quercus rubra*).—This is one of the principal ornaments at Barres, where it assumes large proportions, and fructifies every year, though

its wood is of only middling quality. In Eastern France the wood is said to be much better and to almost equal that of our good native Oaks. At Vaux, in such unfavourable conditions as I have described above, it bears itself bravely and promises to outstrip its uncongenial neighbours, the Pines. The specimens I have are now 29 to 36 feet high and $15\frac{1}{2}$ to $16\frac{1}{2}$ inches in girth.

"All the species enumerated above, whether resinous or deciduous, are hardy in our inclement seasons, all having withstood, without hurt, the severe frosts of 1879-80, with the exception of young plants of the Wellingtonia and the Cedars, the wood of which was not quite seasoned."

"AUTHOR'S NOTE.—Since the above was written the trees described have added two seasons' growth to the dimensions stated. Although I have not thought it necessary to measure them all over again, I may say that the rate of growth has been, on the whole, fully equal, if not superior, to what the trees had already shown."

THE TREE PÆONY.

THE Moutan is a true wild shrub, indigenous to the northern provinces of Ho-Nan and Nan-Kin, where it inhabits mountain regions and whence it was brought to Canton. For countless generations Chinese gardeners have occupied themselves in raising new varieties of this the king of flowers as they call it, and fifty years ago Anderson asserted that they possessed no fewer than 250 distinct sorts representing all the colours which Pæonies are capable of producing. They have crimsons of every shade to nearly black, whites, yellows, purples, roses, and even blues. These are said to be all self-coloured, for the Chinese reject variegated flowers. Some varieties they call Pé-Leang-Kin (a hundred ounces of gold), in allusion to their great value. In 1794 a second variety was introduced by a Mr. Greville; this was named *rosea*, the flowers being of a deep rose-pink colour, while those of Sir Joseph Bank's plant were blush-pink and double. In 1806 a third variety was introduced, and this, because its flowers were single, is considered to be the wild plant. The late Robert Fortune, the Chinese traveller, introduced several varieties of Tree Pæonies, and most of these are in gardens at the present day.

The selection of the best spot in the open garden for the Tree Pæony is more important than any subsequent attention which it re-

quires. It must have an open spot away from the shade or shelter of trees; but, if possible, it should be sheltered from north and east winds, which prevail in spring, about the time when the plant is pushing out its new growths. It should be the aim of the cultivator to retard the growth as much as he can, and if the locality is naturally warm, the Tree Pæony will require particular attention, otherwise a frost in April will destroy both growth and bloom. It is the practice in some places to protect the plants by a movable glass light, or by fitting up around them a temporary framework on which is placed muslin, canvas, or other thin protecting material during the most critical time, that is, from the time when the young shoots begin to lengthen till all fear of frosts is over. If a plant is overtaken by frost, without protection, then the best thing to do is to screen it at once from the morning sun, so that the plant may thaw gradually. In some districts no protection is necessary, and this is the case principally in upland gardens, which are colder than those in the valleys, and, therefore, vegetation does not start so early. In old days when Tree Pæonies were as much thought of as Cattleyas are now, all manner of devices were resorted to in order to tide the plants safely over our treacherous springs, for it was found that scarcely any

amount of cold during the dead of winter harmed them. In many parts of the country, indeed, they came unscathed through the terrible winter of 1837-1838. Some bygone Pæony fanciers used to plant on the north side of hills, so as to retard growth, but such situations had a counteracting effect, inasmuch as the young wood did not ripen, through want of sufficient sunshine. As to position, it is generally admitted that Pæonies look best when isolated on a lawn, not far away from a shrubbery or a group of some sort, but so situated that they appear to have some con-

nection with one or the other, as the case may be. The Tree Pæony may be forced into bloom in early spring with very little trouble, but in order to get good bloom the forcing must be gentle. The plants set aside for forcing should be strong and well rooted, and the shoots should be well ripened. They will, of course, be in pots and in cold frames. About the latter part of January or the beginning of February a few plants should be taken into a house slightly heated; for a week or so they will require no attention, as the buds will be dormant, but as soon as the latter begin to show signs of swelling care must be taken

that the plants do not suffer from drought. At this stage they may be taken to a house where the mean temperature ranges from 50 to 55 degrees, and in this atmosphere the buds will swell quickly and the shoots lengthen, until about the end of February or early in March they will be showing bloom. During this slight forcing period the plants should be syringed daily if the atmosphere feels dry, but when in bloom a dry atmosphere is best in order to preserve the flowering period as long as possible, which, in a cool conservatory, will extend over several weeks when well flowered.



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They make noble vase ornaments for rooms; a fair-sized plant will carry from six to a dozen blooms and buds. All the sorts may be forced equally well, but those which have the brightest or the most delicate colours are the best.

The best soil for Tree Pæonies is a free loam enriched by manure. It is most important to plant at the outset well, for no plant resents root interference when once established so much as the Tree Pæony, and that is why it is so difficult to transplant it without ill effects. After fixing on a spot for planting it out permanently, a hole should be dug quite 4 feet wide and a yard in depth, removing all the soil if not a good loam. Put a good layer

of rubble at the bottom for drainage, and then, with a layer of turfy sods on the top of this, put in the soil ; after a week's interval so as to allow the latter to settle, plant your Pæony. The best time for planting is in the autumn, during September or October. Nursery plants are kept in pots, and at planting time the roots should be disentangled and spread out. Being of slow growth, Tree Pæonies require no pruning, except removing dead shoots. The finest specimens in this country at the present time are from 6 to 8 feet high and as much in diameter, but these plants are very old, some of them having been planted thirty or forty years ago. Specimens such as these have been known to bear as many as 300 flowers in one season.

The usual and best mode of increasing Tree Pæonies is by grafting them on the fleshy roots of the herbaceous kinds, but they may be also raised from seed or multiplied by division of the root, by layers, by cuttings, and by budding. In grafting scions on roots, *P. albiflora* and hybrids from it are preferred,

because they do not throw up suckers in the way in which the common *P. officinalis* and others do. Layering is another simple way of propagating Moutans. If the previous year's shoots are tongued and pegged down firmly in autumn they will throw out roots the first year from each bud, and during the second year after layering may be safely removed from the stool. Propagation by budding and cuttings is also carried out, but it is found that plants raised from cuttings remain in a weak state for several years. Dividing the roots for increase of stock may be done any time during autumn, care being taken that each division carries a few fibrous roots. Seedling raising is not much practised in this country, because it is seldom that seeds are ripened, but in France, where the climate is more suitable for seed-ripening, seedlings are raised with the view of obtaining new varieties. It is an interesting, though slow, process ; the seeds take twelve or eighteen months to germinate, and the seedlings flower when from five to seven years of age.

REVIEWS.

THE GREAT DESERTS AND FORESTS OF NORTH AMERICA. BY PAUL FOUNTAIN. (Longmans.)

THE GREAT MOUNTAINS AND FORESTS OF SOUTH AMERICA. BY THE SAME.

THE title of the first volume is unfortunate from the point of view of one who knows and cares about trees. The author, however, is deserving of respect, as he is a true Nature lover, although his knowledge and observation are more in the direction of reptiles, insects, and the smaller animals than the flora and sylvia of the great northern continent. The absence of an index, too, is an omission, though this, of course, is the fault of the publishers, who instead insert thirty-two pages of their catalogue.

The chapter headed "A Day in a Cypress Swamp" is a good illustration of Mr. Fountain's method and limitations. American swamps abound with animal and reptile life, and very little of it is too minute to escape the eye of this traveller. Slugs, for instance, are exceedingly fond of cheese, and salt is a deadly poison to frogs.

"Here, also, there is a convolvulus-like plant, which grows in magnificent profusion,

hanging in vast shrouds, which are a mass of beautiful white blossoms. Other splendid flowers are so numerous that a description of them alone would fill a volume ; but, unfortunately, I cannot give their botanical names or the orders to which they belong. I was much struck by a well-shaped flower which grew in clusters like the primrose, generally at the roots of trees : it was the size of a dollar, and of so brilliant an orange colour that from a short distance it looked like sparks of fire shining in the gloom of the swamp. Nor are orchids wanting in these swamps, especially on dead or decaying trees, many of which were covered with them, of forms and colours most beautiful. The Okefinoke (name of swamp) has not, I think, been often penetrated (the author was writing of the years 1871 and 1876), and I can assure the lover of Nature, if he is prepared to run the risk of fever, that the farther he forces his way into its gloomy

depths, the more remarkable and beautiful will be the forms of animal and vegetable life he will discover. The spot must be, I should think, a very paradise for the botanist, for in no other place in the States have I seen a greater variety of lovely ferns, flowers, and mosses." But the trees of the great country he visited are not described or referred to, whereas he runs riot in lizard, snake, and animal lore.

The author in the introduction to his second book, "*The Great Mountains and Forests of South America*," supplies, himself, the motive of his wanderings.

"Ostensibly," he says, "my journey to the South was to study bird-life and to make as complete a collection of specimens as possible. A secondary object was to ascertain if the many stories of monstrous serpents found in the remote Brazilian forest had any truth in them. I had some minor objects in mind, but these will appear in the course of my narrative. As a matter of fact, the real object of these travels was to gratify that intense longing to visit remote and little known spots on the earth which was the first cause of my choosing a wandering life, and which I could no more overcome than the sun can fail to give light and heat." An overpowering instinct for wandering and a love of savage and uncontrolled Nature is nothing rare or extraordinary, but, given the knowledge that the hero of these adventures was a cripple and without material means or education, it will readily be admitted that he is a man of no ordinary interest.

Mr. Fountain landed in Brazil in the year 1884. It does not appear that he had the slightest knowledge of either Spanish or Portuguese, and the little preparation he made for his journey was made on the spot. Having decided that his first journey should be a boat voyage on the Amazon and its tributaries, he purchased a fishing boat at Para and had her towed to Obydos, where some necessary alterations and fittings, including a half deck and mast, were carried out, and the craft stored with what he calculated would be sufficient food and necessities for four or five persons for six months. For crew he engaged, after much trouble, two South American sailors,

who, he was assured by those who knew them well, would cut his throat on the first opportunity. He had no choice, however, but to enlist their services or abandon his journey. They proved in the sequel good seamen and faithful companions, and with two savage dogs in addition as camp watchers, the author, after a preliminary trip up the Trombetas River, started to ascend the River Purus, one of the largest and least known of the Amazon's effluents, wending its course through the heart of the vast forest which covers the whole surface of northern Brazil, and in many parts as yet untrodden by the foot of the European.

The "Firefly," as he had named his boat, turned out a miserable old tub, and ill suited for the work before her. The sense of solitude, as the travellers got further from civilization, was intense. The interlacing branches of the forest prevented them from seeing a hundred yards distance on either side. For the greater part of the day this solitude was almost unbroken by any sound save the shrill screams of innumerable parrots and macaws, and the prolonged howling of monkeys in the mornings and at nights. Added to these elements of depression was the lurking presence of the Indians, often rather felt than seen. Some parts where he landed were so densely wooded that the sky was invisible; their progress in the streams was impeded by giant water lilies; remains of dead settlements were stumbled upon. After three days of the gloom of these great solitudes, the author, feeling he could no longer endure the strain, returned, and continued his course up the river until, after a course of some 600 miles, he was brought to a standstill by rocks over which it was impossible to take the boat.

A chapter is devoted to "*Rambling Days in a Central Brazilian Forest*." "Often," he says, "I spent prolonged periods at some isolated spots in the forests, or on the rivers, or on the mountains, as far away from the haunts of men as I could possibly get, studying the ways and habits of beast and bird, by day and by night." His companions here were one of the South American sailors before mentioned (the other had died in the course of his voyage on the Purus), two hired Indians, a negro ex-slave, and his equipment consisted of seven

mules. A person unused to the forest, he observes, would be in a sorry predicament, as only a practised eye could discover the few animals that harbour in its depths. These were chiefly ant bears, sloths, and some smaller animals. One was a porcupine with a long prehensile tail, used freely in passing from branch to branch—an animal that feeds largely on young birds. The author apparently does not agree with the theory of protective colouring of animals. "Is it not ridiculous," he asks, "to talk of such animals as tigers, jaguars, and puma requiring protection? Birds certainly do not get it." "Nature's idea," he concludes, "is to create a pleasing and curious variety to gratify the eye of man, nothing more."

In a chapter headed "The District of the Seven Lakes," he writes: "Tree and plant life of marvellous forms abound. Orchids are among the most striking objects of the floral world, and some of the most beautiful are found in forests so gloomy that they often escape notice; it is surprising that they flourish when they get so little light. Some of the forest trees were remarkable for their bright, brilliant blossoms and spreading limbs." The most interesting to him, however, was the Cow tree (*palo de vaca*), of which he saw several varieties, some of them as high as 60 feet. He describes it as a fairly graceful tree with somewhat angular, drooping branches and moderately-sized oval leaves; the fruit resembles a large green plum, purplish when over-ripe,

the fleshy covering of two nuts. The sap of the tree is a milk having all the properties of the best cow's milk. It is highly nutritious, mixes well with water, hot or cold, and never curdles in coffee, cocoa, or tea. It keeps good for a week and has much the taste of cow's milk in which cinnamon has been steeped. It is rather thicker than cow's milk, having in the mouth the feel of liquid gum. If left standing a thick unctuous cream arises, which when dry has the consistency of wax. It is exceedingly sustaining. Unless the tree is much broken up or cut it does not seem to suffer much from the loss of its sap.

In the marshy parts of the forest grew the Mora, one of the giant timber trees of Brazil, yielding a very hard wood. The forests of the interior were not so impenetrable as those along the courses of great rivers and in the flat marsh regions. The author's wanderings took him among the Ecuador Andes and into the highlands and llanos of New Granada, also to the mountains and valleys of Chili and Peru, regions of stupendous precipices and frightful gaps crossed by precarious bridges.

The book is full of interest. The only pity is that the author's knowledge of trees and plants is not such as to enable him to give fuller descriptions of these; but this is the less to be deplored, as, naturally, the great trees of the South American river banks are not such as we can grow in our hemisphere. The book is illustrated and well printed.

FOOTPATHS.—And there are other simple footpaths, which I remember loitering through day after day, in the rural districts of England, with a sense of enjoyment that never belonged to saunterings in the alleys of Versailles. A man does not know England, or English landscape, or English country feeling, until he has broken away from railways, from cities, from towns, and clambered over stiles, and lost himself in the fields. Talk of Chatsworth, and Blenheim, and Eaton Hall! Does a man know the pleasure of healthy digestion by eating whip-syllabub? Did Turner go to Belvoir Castle park for the landscapes which link us to God's earth? What a joy and a

delight in those field footpaths of England! Not the paths of owners only; not cautiously gravelled walks; but all men's paths, where any wayfarer may go; worn smooth by poor feet and rich feet, idle feet and working feet; open across the fields from time immemorial; God's paths for his people, which no man may shut; winding—coiling over stiles—leaping on stepping-stones through brooks—with curves more graceful than Hogarth's—hieroglyphics of the Great Master written on the land, which, being interpreted, say—Love one another.—IK. MARVEL.

FLORA

AND SYLVA.

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JULY, 1903.

[Monthly.

SUMMER'S GOLDEN RAIN.

Soon after the appearance of Wood Hyacinths, giving us the prettiest ground colour in British woods, there comes in bloom a precious gift of the earth-mother—the trees and shrubs that bear a rain of rich yellow, often pendant, bloom. They are heralded in our own land by the Broom—one of the most graceful shrubs of the northern world. I was looking at it yesterday—a dull rainy May day—as it sprang here and there out of a live fence dividing a meadowed vale from a wood, and wondering what sight in a garden could surpass its fountains of flowers. The seed had been scattered along the Quick fence soon after its planting, and all this loveliness of early summer bloom won without in the least lessening the use or value of the fence. Equally free, and often more showy, is the Spanish Broom, which is hardy in most of our country; and there are a number of other kinds, which, at least on warm soils, would give like effects.

Most beautiful of all such plants, however, are the Laburnums; well known, it is true, but the question is as to their right use and effect. Many have trees of them of the standard

form; it is inevitable that each trade should prefer to take the shortest way—some routine way—that one can follow continually; but when we visit the mountains of Central Europe and see a Laburnum hanging over some high rock which one cannot climb—not larger than a gooseberry bush, yet with its beautiful golden rain all the same—one asks why there should be only one way of using or planting such a lovely tree: why one should not raise this gift of the mountains from seed, instead of always taking grafted plants. In the case of André's bronze Broom, we see that raising even common wild things from seed may some time or other lead to varieties of the highest value for the garden. If the seed of Laburnum is not offered by the trade everywhere, it is certainly saved by all the great seed houses of Europe and offered at very reasonable rates. I have seen plenty of it this year, and I believe it might be scattered about copses, here and there, and even without the trouble of raising it in the nursery.

In any case, it is well worth that attention, assuming that there is room enough for it to be grown in an effec-

tive way; and, if so, it might well be raised and allowed to take the place of the ordinary shrubbery seen even in places that are famous for their gardens. In these, when we get away from the garden, the common Elder, Laurel, and Privet, and other woody shrubs, are sometimes seen almost by the acre. Why should not such really beautiful things as the Alpine and common Laburnums be grown freely and naturally in lieu of such weeds? It is not only one Laburnum we have to think of, but two beautiful species, one coming later in flower. In recent years these trees have varied in a remarkable way; and the varieties gained on the Continent are remarkable for grace as well as fine colour, the racemes of some being nearly as long as the arm.

Usually for bold gardening effects the wild type of tree is the best, but in this case the varieties are certainly most remarkable and very little known compared with what they deserve to be. In these varieties we have proof of what we get by raising such things from seed—

a splendid addition to flowering trees. We ought not only, therefore, to sow seed that we may buy, but we should follow the good old-fashioned way of saving seed of the trees we have, and all who have these beautiful new Laburnums in their gardens should save the seed, not only for stock for bold planting in copses and shrubberies, but also for the advantage of raising new forms.

Of the two wild Laburnums there are numerous varieties, differing more or less from the parents. The number of named varieties of *L. vulgare* in nursery lists exceed a score, and among the finest varieties are those named *Alschingeri*, *Carlieri*, and *grandiflorum*, all bearing very long racemes. Of the Alpine Laburnum good varieties are *Watereri*, *Parksi*, *grandiflorum*, and *biferum*, all having long racemes. There is some doubt as to which species these newer varieties belong, but their value is the main consideration, and the best of them are hybrids between the two, or forms of the Alpine Laburnum.

* * *

TREES FOR THEIR BEAUTY.—I want you to understand, in the first place, that I have a most intense, passionate fondness for trees in general, and have had several romantic attachments to certain trees in particular. Now, if you expect me to hold forth in a "scientific" way about my tree-loves—to talk, for instance, of the *Ulmus americana*, and describe the ciliated edges of its samara, and all that—you are an anserine individual, and I must refer you to a dull friend who will discourse to you of such matters. What should you think of a lover who should describe the idol of his heart in the language of science, thus—Class, Mammalia; Order, Primates; Genus, Homo; Species, Europeus; Variety, Brown; Individual, Ann Eliza; Dental Formula.

No, my friends, I shall speak of trees as we see them, love them, adore them in the fields, where they

are alive, holding their green sunshades over our heads, talking to us with their hundred thousand whispering tongues, looking down on us with that sweet meekness which belongs to huge but limited organisms—which one sees in the brown eyes of oxen, but most in the patient posture, the outstretched arms, and the heavy drooping robes of these vast beings endowed with life, but not with soul—which outgrow us and outlive us, but stand helpless—poor things!—while Nature dresses and undresses them, like so many full-sized but underwitted children. . . . Who cares how many stamens or pistils that little brown flower, which comes out before the leaf, may have to classify it by? What we want is the meaning, the character, the expression of a tree, as a kind, and as an individual.—O. W. HOLMES.

THE GREATER TREES OF THE NORTHERN FOREST.—No. 4.

THE SUGAR PINE (*Pinus Lambertiana*).

THIS beautiful Pine was discovered in Oregon by the famous explorer, Douglas; and no picture of exploration is more clear to one's imagination than that of Douglas, in the great forests of Columbia, long before the American settlement of Oregon or the conquest of California, coming upon this noble Pine and carrying off specimens of the cones from among warlike Indians. It is found on both the eastern and western slopes of the Sierra Nevada and northward to the Columbia, at from 3,000 to 7,000 and sometimes 8,000 feet; also, though less frequently, on the highest portions of the coast range: but it reaches its noblest proportions in some of the great timber districts of the Californian Sierra on the western slopes, at from 5,000 to 7,000 feet. It is one of the most striking trees of the wide Pine forest belt of the Pacific Coast, and ranks among the five or six of the giant conifers of the world. Even in California, with all its other enormous conifers, the opinion of mountaineers who live in the land of great trees, as well as the botanists and Sierra-climbers from our valleys, is that this Pine is quite worthy to hold its head up even in the presence of the big tree Sequoia.

As one rides along the narrow, rocky trails of the Sierra, up vast cañons and over ridges, from which for miles upon miles the grey granite, the wild rivers, the snow peaks, the wide, dark forests stretch out against Alpine heights, one comes now and then upon a group of a few Pines or single trees of these that surpass in majesty the finest Pines of California. So clean and bright, so tall, well shaped and great are their shafts, so light and graceful their crowns, so bright and living is the colour of their far-distant masses of foliage, that the effect seizes strongly on one's imagination and never quite passes away. Compared with the Sugar Pine, the great western Yellow Pine (*P. ponderosa*) is an unrefined plebian of a tree, and even the ancient, massive, well-buttressed shafts and shaggy tops of the big tree Sequoia, more awe-striking in its mass, moves the heart less to affection.

How great a tree the Sugar Pine can become in its native home mere statistics hardly show. Trees have been measured that were 14, 16, 18, or even 20 feet in diameter and 300 feet or more in height. Such trees, if sound, contain from 300,000 to 400,000 feet of useful timber and an enormous amount of cordwood and waste; but, fortunately, these great trees are extremely difficult to handle, liable to break to fragments when felled, and therefore are generally left to live out their stately lives.

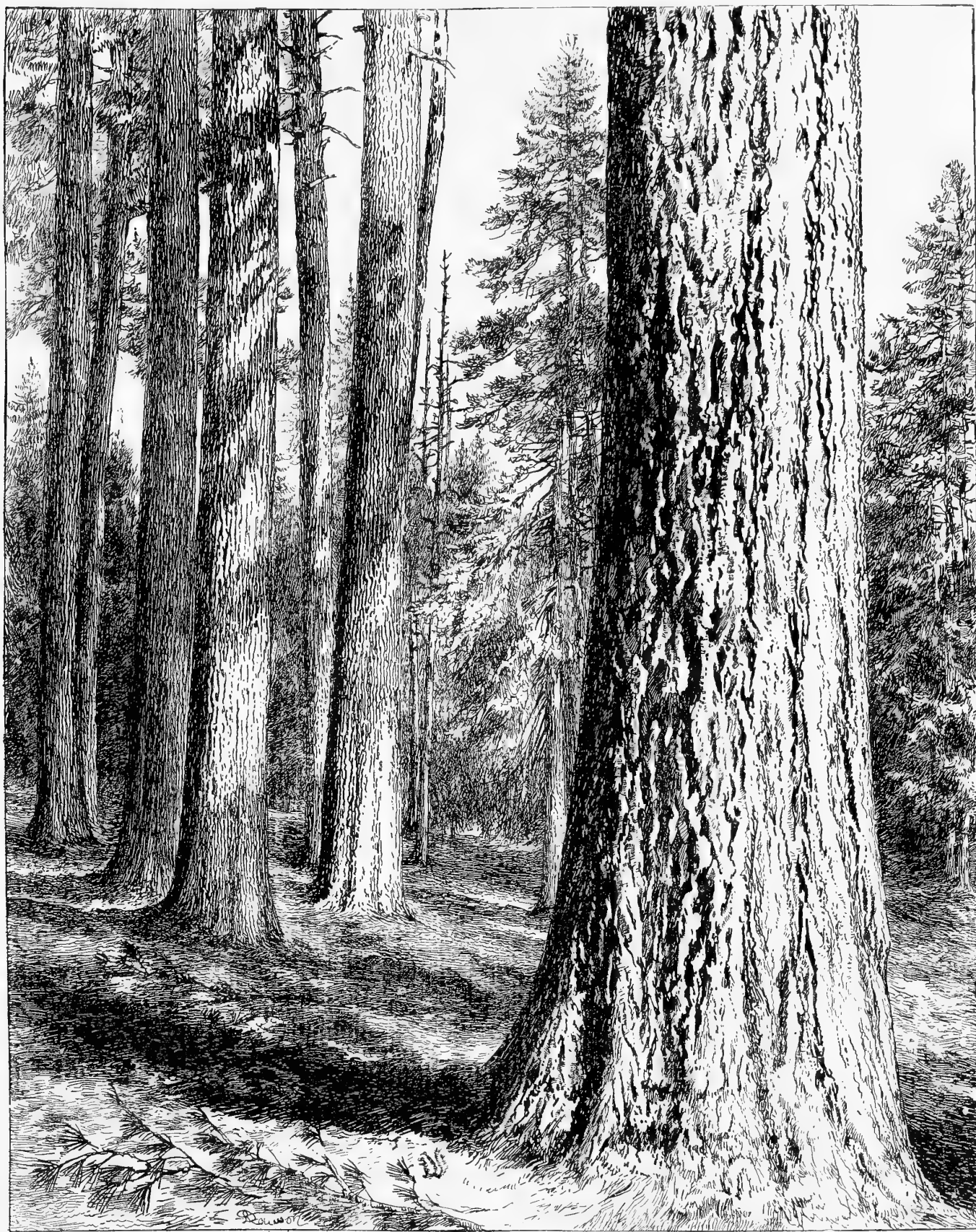
I have lately measured a Sugar Pine that was 12 feet in diameter measured breast high, and could have been little less 20 feet higher. It stood a little apart, on a knoll in the forest, and the smooth shaft rose above surrounding

Pines and Firs which were 150 feet high, while its sunlit crown, well-laden with giant cones, was not less than 275 feet above the base. Such a tree, if it ever comes to the saw, yields, even with our wasteful western methods, upward of 100,000 feet of beautifully soft light-coloured timber, fitted for many uses on account of its uniformity of grain and freedom from "pitch." In fact, the housewife in the Sierras desires only this wood in her kitchen, pantry, buttery, and wardrobe. The heartwood is a light brown colour, becoming whiter towards the bark.

Sugar Pine wood splits so even and easily that the shake-makers of the Sierra will take no other species as long as they can buy or steal a Sugar Pine. These shake-makers are a peculiarity of the California forests. A "shake" is a long split shingle, nearly uniform in thickness; the best average 6 inches wide, 32 inches long, and from one-sixth to one-fourth of an inch in thickness. Occasionally they are made even 4 feet long, and many of the poorer grades are only 2 feet long; but the standard grade is of the size first named, and sells in the woods for five or six dollars a thousand, or for twice that when hauled down to the towns. Even at these prices they are preferred by many persons to sawn shingles or thin boards for roofing, as they can be put on very rapidly, and will last many years if protected by fish-oil or roofing paint. In the towns they are chiefly used on outbuildings, seldom on dwellings; in the rural districts shakes are almost always used. All through the mountains of California most of the houses, barns, sheds, mining buildings and other structures have always been roofed with shakes, and the shake-maker is as picturesque, though never as harmless, a figure as the prospector and the placer miner.

More than half a century back the value of the Sugar Pine for this destructive industry was discovered. Apparently there were no officials in California who felt bound to watch over the Government lands, and everyone cut trees where and when he chose. Shake-makers, singly or in little groups of three and four, made camps in the Sierra and felled the finest trees, often in total ignorance as to whether they would split well (for even Sugar Pine must be carefully chosen for this purpose, and not more than half of them are first class). One still finds only partially decayed logs of superb Sugar Pines in the forests, trunks 5, 10, or even more feet in diameter, which were cut down and left by these gypsies of the tree-felling profession. Still more often one finds fine trunks from which only 20 or 50 feet were "worked up," leaving thousands of feet of fine timber unused. The wiser shake-makers spend much of their time hunting for these logs, and manage in many cases to split wagon loads of shakes from such neglected trees. They also cut down many dead Sugar Pines, and work up the larger part of the trunks.

A young mountaineer who has learned the knack of blocking out a log into "bolts," or pieces 6 inches square and of the desired length, and, further,



THE SUGAR PINE (PINUS LAMBERTIANA).

(Engraved for FLORA from a photograph sent by Charles H. Shinn, U.S. Head Forest Ranger.)

of splitting these bolts evenly, rapidly, and without a waste stroke, into useful shakes, is spoiled for all other kinds of work. Without capital or outfit other than an axe, saw, and riving knife (called a "fro"), despised by the real lumberman of the saw and shingle mills and watched with care by the rangers and officers of the U.S. Forest Reserve, and by the owners of private forest lands, he goes forth, audacious and independent, a veritable poacher of the forest, buying a tree if it serves his turn to do so, and surprised beyond measure if he errs respecting a boundary and is brought up to judgment. In vain may one talk to such a shake-maker, whose fame is spread abroad over six counties, of the profit of a shingle mill, or of a small lumbering plant, for which he could pay in a few seasons, become an employer, and settle down in a legitimate business. In vain one points out the inevitable end of his occupation, as private owners of forest lands on whom he chiefly depends for a supply of Sugar Pine learn to protect their tracts better or refuse to sell him any stumpage. He laughs in your face with contagious glee, and climbs back to his camp by some mountain spring, in thickets of Dogwood or Azaleas under the great Pines and Firs.

If no shake-makers had ever existed in California the Sugar Pine would still be scarce as compared with the Yellow Pine and its near relative, *P. Jeffreyi*. In fact *P. Lambertiana* never occupied a very large area of our forests, though it is very plentiful in portions of Shasta, Butte, Eldorado, Fresno, and some other districts. The tree does not reproduce itself rapidly, and one never finds large groves among the second-growth areas which are springing up in timber cleared districts. There is therefore need of care, or this beautiful Pine will become less and less a distinctive feature of the West American forests.

Much might be done by collecting and planting the seed on a large scale on suitable and unoccupied slopes of the middle Sierra. The tree fruits heavily, especially in favourable years, but the squirrels are very fond of the seeds, so much so that they climb clear to the top, run out on the tips of the branches, and gnaw off thousands of the cones. In many cases these contain only diseased and defective seeds, but nearly all the mature seeds are secured by the animals and stowed away in hiding places. If in the earth, some deposits are forgotten by squirrels with short memories, and often grow,

The young Sugar Pine is a lovely tree at all stages of its growth, and can be picked out as far as the eye can see it from among other conifers of similar ages. When beginning to fruit, and while still young, graceful, and flexible far beyond other Pines, a tree of 80 or 100 feet in height stands against the horizon, holding on its drooping branches these clusters of bright brown cones 12 to 18 inches long, it seems to thrill with the joy of growth, of life, and its transmission of life in Nature's ceaseless round. Its many cylindrical cones appear to be shining lanterns upheld by an immortal Titan in the higher regions

of the great forest spaces. One wishes that growing up in such a mountain land he could mature and grow old at last no more rapidly than such a Pine tree does, nor less securely nor less unconquerably could rejoice in mere living.

CHARLES HOWARD SHINN.

We should be grateful to our tree-loving readers if they would tell us how this great Pine does in our country. Clearly it is not well suited for it, or we should probably see more of it. Still, any light that can be thrown on the point will be useful; even though for all true planting that a tree should be hardy is the first essential. Veitch ("Manual of the Coniferæ") says:—

"In England *Pinus Lambertiana* thus far shows no indication of rivalling the gigantic dimensions of its parent in California. Although introduced fifty years ago, there are few specimens that exceed a height of 50 feet; its growth in all soils and situations is very slow, especially during the first years, from the seed. It is, however, a handsome tree of erect habit, with branches short and slender in pro-

portion to the height of the trunk, the lower ones spreading, those higher up with the ends inclined upwards, and the highest ones ascending, and generally well furnished with foliage distinguished by its bluish-green tint. To ensure a good specimen of this noble tree, it should be planted in a situation sheltered from winds blowing from the north, north-east, and east."

FRITILLARIA (FRITILLARY).*

BULBOUS perennials, numerous natives mostly of Europe and Asia Minor, many of slight garden value, others very precious from that point of view, such as the Crown Imperial and *F. recurva*, but most have dull-tinted flowers. The Crown Imperial is a fine plant for naturalizing, and, being vigorous, is able to take care of itself in the wild garden. The Snake's-head and others, like *F. latifolia*, *pyrenaica*, together with the choicer kinds, are fitted for grassy places, usually in a free soil. They may all be readily increased by offsets from the old bulbs, which should be lifted every three or four years and planted in fresh soil; we mean the kinds in beds or borders—those naturalized in grass may be let alone for many years.

Comparing them with Lilies, many of the kinds of Fritillaria are hardly worth growing, but, being with few exceptions amenable to culture, some are most valuable and welcome in spring. Take, for instance, the common British sort, how effective it is grown on lawns and meadows, whether it has been at

first carefully planted or wild, as on some of the meadows of the Midlands. By intercrossing and selection of the northern *F. meleagris* and the southern broad-leaved kind, *F. latifolia*, a great number of interesting sorts have been raised, many of them of peculiar beauty. Unfortunately they do not thrive so well in heavy soil, and are therefore not so well known; but this is certain, were the same efforts used in hybridising the many types of Fritillarias as is done in the Narcissi, we might soon have many hardy, robust, and more distinctly showy kinds of Fritillaria. They are nearly all, as far as the Old World kinds are concerned, indigenous to the south and east; on the borders of the Mediterranean Sea there are the pretty Maritime Alps species *F. Moggridgei* and *F. Burnati*, the former recurring, but in a more modified form, in the Syrian *F. aurea*, and on the Spanish Pyrenees is the tall *F. pyrenaica*, as well as the pretty *lutea*, probably a natural cross. In Algeria is the interesting *F. oranensis*, not differing very much from the Dalmatian *F. messanensis* and a number of

* With coloured plate from a drawing by H. G. Moon, at Warley Place,

interesting forms most likely natural hybrids between the everywhere common *F. latifolia* and other kinds. The greatest number of Fritillarias are, however, from the Orient. M. Boissier, in his admirable "Flora Orientalis," describes alone thirty-four to thirty-six species, and since then others have been added, such as the charming *F. askhabadensis*, a plant recalling at the same time the stately *F. imperialis*—to many people obnoxious, owing to its strong smell, and the tender *F. persica* and *F. libanotica*. From Persia we shall probably get many good novelties, while the comparatively recent discoveries of the indefatigable traveller, Mr. A. Regel, in the Russian territories in the hinterland lead us to expect other introductions.

Culture.—A few rules are applicable to almost the whole of the different kinds; they like re-planting when dormant, and the earlier in the autumn the better, in a sandy soil, although a few do well enough in loam, marl, or chalk, and being, as in Lilies, meadow or hillside plants when in the wild state, they naturally are surer of success when grown in similar positions or where they have the necessary shelter in the early spring against cutting winds, sharp frosts, and, not the least, against the sun. The shade of a few blades of grass or dwarf shrubs and the consequent equable moisture is most essential to their well-being and reproduction by seedlings, which take the place of the parent plants as these weaken and disappear. Then it must not be assumed that bulbs are everlasting; with few exceptions, it is more than doubtful whether they flower more than three or four times, and then yield place to those fitter for the struggle of existence. In starting plants from countries with a later spring, they often suffer unless acclimatized for a year or two by treatment as half-hardy plants. Bulbs raised in this country from seeds are preferable to those imported.

F. armena.—In this, the flowers vary in colour, and are disappointing until the bulbs get well established. Imported bulbs, from being so long out of the ground, and from other causes, take a year or two to get established, after which they flower freely. The flowers are drooping, tulip-shaped, and dark purple without tessellation. The leaves are

somewhat long, bright green, lanceolate. The variety *fusco-lutea* has bright yellow flowers in April and May. Armenia.

F. askhabadensis is, like the Crown Imperial, quite as tall in growth but slightly smaller flowers, which are white or sulphur, and in a warm room exhale a distinct and delicious scent. A strong plant will produce as many as eighteen flowers. Some imported bulbs I potted up last November and treated quite like other forcing bulbs (plunged in the open until well rooted, and then put in the shelter of a deep cold frame) soon flowered, and were quite a distinct feature of more than one show of the Royal Horticultural Society, proving far better than those in the open ground, which had their flowers destroyed by the late frosts.

F. aurea is one of the prettiest of the genus. The flowers are bright yellow both inside and out, with numerous dark brown tessellations, especially near the base. It was first discovered by Dr. Kotschy on the mountains in Cilicia, and seems to be a very easy one to manage. It is now well established in many gardens, and is a very pretty early spring flower, but in some situations suffers from our late frosts.

F. delphinensis is a charming Fritillary, of dwarf habit, and with handsome flowers. There are four to six leaves to a stem; the flowers, generally of a purplish brown or with yellow markings, are large and well formed, appearing in July. The var. *Burnati* is a pretty variety growing from 6 to 9 inches in height, with a solitary flower about 2 inches long of a bright plum colour chequered with greenish yellow. It flowers earlier than the next, and is a native of the Maritime Alps, the Tyrol, and Corsica.

The var. *Moggridgei* is a dwarf form of *F. delphinensis*, with much lighter flowers, produced a month or so earlier. It was found by Mr. Moggridge near Giandola in the Sospello Valley, at about 4,000 feet elevation, and flowers about the middle of April. It blooms a little later here in the south of England. The flowers are large and well formed, of a good yellow, faintly chequered with reddish-brown leaves, which are much broader than in the type.



F. græca (the Greek Snake's-head) is a very handsome and well-marked species. It is perfectly hardy in the open air, and an excellent bulb for exposed situations, its sturdy stems being proof against all weathers. The bulbs increase with great rapidity. In this species the flowers are hardly chequered at all; each segment, however, has a green line down its centre, though in some forms this line is absent, and its place taken by the red or purplish red of the segments with a few brown spots.

F. imperialis (Crown Imperial) and varieties constitute, for the border at least, the showiest and boldest of the genus. The blossoms, which in all the varieties are by far the largest of the genus, are of various shades of colour—yellow, sulphur, red, orange-red, and a variety with red blossoms and variegated foliage. Perhaps the finest form yet known of this plant is that figured in *The Garden* as *F. i. longipetala*, very handsome in colour.

F. latifolia.—A variable species with flowers borne on stems about 1 foot high, pendulous, and varying in colour through various shades of purple, black, lilac, and yellow. Among the principal varieties are Black Knight, Captain Marryat, Cooper, Jerome, Maria Goldsmith, Marianne, Pharaoh, Rembrandt, and Shakespeare. They grow freely in an open situation in any soil, and are excellent for naturalising. Caucasus.

F. lutea (great yellow Fritillary).—A fine species nearly allied to *F. latifolia*. It is also a native of the Caucasus, and a rare plant in gardens. The leaves are spear-shaped, about 4 inches long; the flowers, coming in April and May, are yellow, tessellated with pale purple markings.

F. meleagris (Snake's-head) is an elegant native plant, of which there are several varieties. It is 9 to 18 inches high, bearing in early summer a solitary drooping flower, tessellated with purple on a pale ground. The chief varieties are—*alba*, white; *nigra*, purplish-black; *pallida*, light purple; *angustifolia*, with narrow leaves; *major*, with larger flowers; *præcox*, which flowers about a week earlier than the other forms; *flavida*, yellowish; and the rare double variety. All forms of this plant may be used with excellent effect. It grows freely in grass not mown early, and is there-

fore admirable for the wild garden; best in cool, alluvial meadows. Flowering but a short time in sunny weather, it is best for the wild garden, and should be planted in various aspects.

F. pallidiflora.—A distinct kind, large and free, with pale yellow flowers, chequered within. A feature of the kind is the leafy nature of the plant, so much so that the flower-buds emerge in some instances from a cluster of glaucous leaves at its summit. The plant is of easy culture in rich sandy loam. Height about 12 inches. Siberia.

F. pudica.—One of the most beautiful of hardy bulbs; a native of the Sierra Nevada of California, where it grows in a dry region. It is one of the best spring flowers, being nearly 6 inches high, and having bright golden-yellow flowers, graceful in form and drooping like a snowflake. It thrives in warm, sunny borders of loamy soil.

F. pyrenaica (black Snake's-head) was in cultivation previous to 1605, and though the flowers are small, they are so abundant as to make it welcome as a border bulb. The leaves are thickish, glaucous, and somewhat distant on the stem. The flowers are about half the size of those of *F. meleagris*, not chequered, and emit a disagreeable odour.

F. recurva.—A native of California, differing from the European Fritillaries in the structure of its bulbs. It is a difficult plant to grow, the old bulbs breaking up and producing bulbils from the scales, the stem, from 2 to 3 feet high, bearing in April numerous orange-red flowers, the inside spotted red on a yellow ground. It thrives best in a sandy, peaty soil on a warm sheltered border, and it is best to protect the bulbs in winter.

F. Walujewi.—A distinct and fine plant; worth a place in all collections. Externally the blossoms are whitish and shaded with dove colour, internally marked with white on a crimson-brown ground. There are, however, varying degrees of these shades in the collected plants. The species is quite hardy, succeeds well in loam and peat, reaching 15 inches high. The large, solitary, drooping blossoms are distinct and handsome, and in a large group give a fine effect. Turkestan.

G. REUTHE.

IS DIFFERENTIATION, OR DIFFERENCE IN CONSTITUTION, IN FLOWERS NECESSARY FOR THEIR COMPLETE FERTILITY?

"THERE is the clearest evidence," Darwin says, "that the advantage of a cross depends wholly on the plants differing somewhat in constitution, and that the disadvantages of self-fertilization depend on the two parents, which have the stamens and pistils combined in the same flower, having a closely similar constitution" ("Cross- and Self-Fertilization of Plants," p. 254). To these conclusions Darwin was led by the method which he adopted in his experiments with flowers.

The flowers on which he experimented were placed under a close-meshed net. The net necessarily deprived the flowers under it of the full influence of the solar rays and wind. It would consequently affect the full ripening of the pollen in flowers grown under such a condition. "My experiments," Darwin says, "were tried in the following manner: A single plant, if it produced a sufficiency of flowers, or two or three plants were placed under a net stretched on a frame and large enough to cover the plant without touching it. On the flowers thus protected several flowers were marked and were fertilized with their own pollen, and an equal number on the same plants were at the same time crossed with pollen from a distinct plant. The crossed flowers had not their anthers removed" (*ib.*, pp. 10, 11).

In these experiments, consequently, the crossed flowers had a great advantage. The self-fertilized flowers had only their own pollen, and that developed under the net, to fertilize them, but the crossed flowers had not only their own pollen—for, as we have seen above, their anthers were not removed—but pollen from another plant applied to them as well, *and that too grown naturally outside the net*; for Darwin wished, by leaving the flowers their own pollen, and at the same time crossing them with other pollen, "to make the experiments as like as possible to what occurs under Nature with plants fertilized by the aid of insects."

The cross-fertilized had consequently two sets of pollen to choose between, and which-

ever happened to be most in its prime that would exercise a prepotent influence in the fertilization. But the flowers fertilized with their own pollen had no other pollen but their own to depend upon, *and that developed under the net*, which must fertilize them, or none at all.

It is a well-known and well-established fact, from thousands of observations amongst farmers and gardeners generally, that flowers grown under shade have their productive capacity very much impaired, and sometimes entirely obliterated. Darwin consequently found that the flowers self-fertilized under the net, either with their own pollen or with that of the similarly covered flowers on the same plant, produced seeds inferior, oftentimes in number as well as in quality—as evidenced in the inferior size and vigour of the seedlings grown from such seeds—to those of flowers on the same plant crossed from the pollen of a plant grown naturally outside the net.

Effect of shade.

We here give in illustration of Darwin's method his experiment with the Foxglove recorded on pp. 452, and 82, 83, of "Cross- and Self-Fertilization of Plants."

Darwin experimented with two plants of the wild Foxglove (*Digitalis purpurea*) growing closely adjoining each other in the same clump. One of the plants he covered with a net, and when the flowers expanded he fertilized some of the flowers of the covered plant with pollen from their own flower, or from other flowers on the same plant; other flowers on the covered plant he fertilized with pollen from the uncovered plant. As the two plants were growing almost side by side, the difficulty necessarily arose how could "two or more plants growing close together, either in their own native country or in a garden, be differently acted on, inasmuch as they appear to be exposed to exactly the same conditions" (p. 452). The results and conclusions at which Darwin arrived from this experiment we record in his own words. "Some flowers on a wild Foxglove," he says, "were self-fertilized and others were crossed from pollen from an-

other plant growing within a distance of two or three feet. The crossed and self-fertilized seedlings raised from their respective seeds produced flower stems in number as 100 to 47, and in average height as 100 to 70. Therefore the cross between these two plants was highly beneficial; but how could their essential organs have been differentiated by exposure to different conditions? The reply which Darwin makes is, "Seeds are often widely dispersed by natural means, and one of the above two plants, or one of their ancestors (!), may have come from a distance, from a more shady or sunny, dry or moist, place; or from a different kind of soil, containing other organic or inorganic matter." Darwin need not have travelled so far afield for an explanation of the results he met with. His own net supplied what he went so far afield to seek. The pollen of the self-fertilized was from a "more shady situation," *i.e.*, from the pollen of a flower matured under his net; and the pollen of the cross-fertilized was from the "more sunny situation," being grown uncovered. The so-called differentiation Darwin had himself created in these two closely adjoining flowers. All that this experiment showed was that pollen naturally grown was prepotent over that which was grown under artificial protection. It was no matter of ancestry; nor was it matter of differentiation (in Darwin's use of the term) in the crossed flowers, but of *deterioration* under the net, of the pollen of the self-fertilized ones.

On a similar principle Darwin's experiments throughout were conducted. Now, not only is there no evidence for his theory of the necessity of differentiation or difference of constitution in flowers of the same species for their complete fertility, but, in our opinion, his theory is fundamentally at variance with the arrangements and operations of Nature. If Darwin were right in his assumption "that the disadvantages of self-fertilization depend on the two parents, where stamens and pistils are combined in the same flower, having a closely similar constitution," all flowers which had both stamens and pistils in the same corolla (and consequently the vast majority of flowers) would, for their primal purpose—the production of seed—be wrongly,

or in Darwin's language, "disadvantageously," constituted. Nature would have done her best in that case to minimise, or in a measure to thwart, and even to defeat in many cases and in many seasons when insects were scarce, her own special purposes. Elsewhere Darwin says, "We should always keep in mind the obvious fact that the production of seed is the chief end of fertilization, and that the end can be gained by plants which have stamens and pistils in the same flower with incomparably greater certainty by self-fertilization than by a cross between two distinct flowers or plants" (*ib.*, p. 3). In our opinion the less the differentiation between stamens and pistils, the greater the ordinary fertility of the flower. It is *similarity*, in our opinion, not differentiation of constitution of a species which conduces to complete fertility. Our opinion is grounded on the fact that the greater the differentiation, as between distinct though closely allied species, the greater is the sterility when crossed. Even Darwin allows that the differentiation must be limited. He says, "The veil of secrecy is as yet far from lifted, nor will it be, until we can say why it is beneficial that the reproductive elements should be differentiated to a certain extent, and why, if the differentiation be carried still further, injury follows" (*ib.*, p. 460). It was from the invalid method with his net that Darwin concluded that "differentiation to a certain extent was beneficial." Nature, on the other hand, teaches us in many instances, as distinctly as she possibly can, that similarity of constitution when the flowers are healthy, is productive of complete fertility.

This is seen primarily in inconspicuous flowers. All plants with inconspicuous flowers, which are consequently denominated "weeds," and which, from their marvellous and unrivalled fertility, are the pests of farmer and gardener, are allowed by all to be self-fertilized. There is nothing in the growth of such "weeds" that can cause any differentiation between their stamens and pistils. They grow with the same surroundings and the same atmospheric conditions, and with the same sap circulating in their systems. Similarity, not differentiation, can alone be predicated of the constitution of the reproductive elements in

No evidence
of
differentiation.

Weeds
self-fertilized.

such cases. It would be contrary to all natural operations to predicate in them any differentiation in constitution. If special instances were demanded, no stronger evidence could be given to the fact than such a flower as the ever-present and ever-vigorous Groundsel (*Senecio vulgaris*), which flowers and seeds all the year through, almost irrespective of seasons and assuredly perfectly irrespective of insects.

In fact, the whole family of the *Compositæ*, of which the Groundsel is a member, could be cited in similar evidence.

The Compositæ. The members of this family of flowers are by their construction necessarily almost unexceptionally self-fertilized, as in them the pistil passes in its growth through the closely encircling tube of ripened anthers, and carries with it, as it advances, the pollen to the mouth of the florets.

The late Mr. Meehan, the American botanist, says of two of the flowers—the Dandelion and the Ox-eye Daisy—which are typical examples of two of the great divisions of the order, that “they showed that they were self-fertilizers. In the Dandelion, as the pistil grew it carried the pollen with it. The apex of the pistil then forked, and watchers could see that as the cleft opened the pollen on the line of the cleft fell in. It was but a little, but that was enough. In the Ox-eye Daisy the pollen fell into the stigmatic cavity more easily than in the Dandelion. Insects might visit it subsequently; it would make no difference, having already received its own pollen.” The *Compositæ* are, as Bentham tells us, “the most extensive family among flowering plants, and are represented in every quarter of the globe and in every description of station” (“English Flora”).

FIELD NATURALIST, M.A.

(To be continued.)

THE FOUNTAINS IN TRAFALGAR SQUARE.—For years I have seen these huge and ugly basins with regret and put down to our British toleration of ugliness that the most used of any open space in London should be so degraded. Apart from the filth of the water the square is wholly wrong from the point of view of good and simple design. If we are to have such breathing spaces in crowded cities, surely it is only plain reason to ask that they be not merely to add to the areas of asphalt and stony surfaces with which we are already amply supplied? The mistaken idea of these huge fountain basins is taken from cities like Rome with a long and hot summer. Fresh and delicious water coming from the hills and tumbling into the hot places of Rome, supplying the people with water and cooling the hot streets, was a necessity, and Roman artists made their fountains worthy of their great use and of the city of Rome. But in our cool and moist country there is no need, artistic or other, for the introduction of huge water-basins of this character, and we may see the hideous result in other places as well as Trafalgar Square—for example, the head of the Serpentine. On the other hand, we have evidence, both in London and other cities, that such

small places may be fresh and beautiful, even in the smoke. There is surely enough work for our architects to rebuild our houses and cities, without despoiling open spaces, which, with a little thought and care, might add to the beauty of the town. Even their own true work suffers, as such “architectural gardening,” as it is called, offers no relief to buildings as even poorly planted squares do. The spaces about Trafalgar Square are so wide and airy, that there is not the slightest occasion to leave a wide spread of asphalt towards the middle. There might be two lines of trees on the upper terrace, and the tramps who now defile the whole place should be kept to that or some other fixed place, and not occupy, as they do, the best place in the square. The warm side would be a happy place to grow the flowers that in our climate enjoy and need the sun. Let anyone who looks at this square in its present state go and look at some of the smaller squares in the West Central District, and then compare the effect. The gardening in the squares of London is the worst of any city in Europe—men digging and muddling about overgrown privet and like rubbish—yet the trees save the situation as they would Trafalgar Square.—Letter in *Lancet*, June 13th.

THE REDWOOD WILLOW (*Salix fragilis*).

IN much of our woodland country south of London this tree is not very common, and, occurring in an incidental sort of way, little or no thought is given to it, even by those who know the value of our native trees like the Oak, Ash, or Beech. But in Essex and other counties this Willow is often a handsome tree,

and have ever seen a Willow plantation in its prime will readily forget its beauty any more than the owner can forget its profit. Lowe, in his "Survey of the County of Nottingham," states that so very valuable are Willows as plantation trees that at eight years' growth they yield in poles a net profit



OLD TREES OF REDWOOD WILLOW.

and a profitable one where its uses are known. Gilpin asserted that the Willow did not harmonize well with British timber-trees, and some writers have reiterated this absurd statement. Of all the trees grown in Britain, not excepting any exotic tree whatever, the Willows rightly grown and grouped are the most beautiful. Few who care for trees

of £214 per acre, and in two years more yield £300 per acre. Six trees felled in 1869, near Southwell, Notts, after thirty-eight years' growth, yielded 232 feet of measurable timber, which sold on the spot for 1s. 2d. per foot; yet the trees did not occupy more than eighteen square yards of land. It is not an uncommon thing for a Willow at

thirty years of age to yield 45 feet of measurable timber, or at the rate of one and a half cubic feet per annum. This Willow will not arrive at its fullest size and quality in undrained land, and it grows freely on the slopes of exposed hills; indeed, there are few situations in which it will not grow, differing in this way from the White Willow, which is more of a swamp and riverside tree.

It may be asked, what use is the timber of the Redwood Willow when grown, and where will a market be found for it? There is no wood in greater demand than sound Willow; it is light, smooth, soft, tough, will take a good polish, and does not easily burn. It will bear more pounding and hard knocks without splinter or injury than any other known wood, and hence its use for cricket bats, and, whenever it can be obtained, for the floats of paddle steamers, "strouds" of water-wheels, break-blocks for luggage and coal trucks, the sides and bottoms of carts and barrows. To the wood-turner it is almost invaluable, and were it grown as timber, and obtainable, it would be used for very many purposes to which foreign timber is now applied. It is not every tree that brings the best price, but single trees, sound and fit for making cricket bats, have been known to fetch, in Essex, as much as £60 each. A correspondent of *Farm and Home* (J.W.R.) writes: "There is an old rhyme anent the two gateposts standing as rivals; on one was written 'I am heart of Oak, I am very stout'; on the other, 'I am Willow red, I'll wear you out.' I have had the two kinds of posts stand long

side by side on my farms and neither showed more decay than the other. Red Willow is valuable where timber has to bear a good bit of jarring. It springs and rebounds to a marked degree without being in the least the worse for it, and endures all kinds of weather on land, and salt and other water off the land, better than, perhaps, any other timber. It would, no doubt, be used in shipping more than it is if it could be got of sufficient size." There is a wood of some six or eight acres of this Willow on the banks of the Lea at Stanboro', near Hatfield, the effect of which is beautiful at any season. As this Willow may be considered one of the neglected trees, if any of our readers could tell us anything of its use and prevalence in any parts of the eastern country we should be very glad to hear from them.

Mathieu, in his "*Flore Forestière*," says nothing as to its value, but there is a spirited book by Patrick Mathew on "*Naval Timber and Arboriculture*" (Edinburgh, 1831), in which is an interesting account of it:—

"This kind of Willow, once very common in the alluvial parts of Scotland before the introduction of the white and the Bedford Willows, is probably the most profitable timber that can be planted in such soils. It was our district's maxim that 'the Willow will purchase the horse before any other timber will purchase the saddle,' on account of its very quick growth and the value of its timber. It delights in the rich easy clay of our *powrs* (the old Scottish term for those sluggish, natural drains of our alluvial districts), throwing out its febrile roots in matted-like abundance under the water; it also flourishes in the more sandy, gravelly alluvium, by the sides of rivers and streams, which does not become too dry in summer.

"The use of the Red Willow as timbers of vessels has been of long standing in this part of Scotland, and has proved its long endurance and excellent adaptation. By reason of its lightness, pliancy, elasticity, and toughness, it is, we think, the best without exception for the formation of small fast-sailing war-vessels. We are pretty certain that our Navy Board would not have cause to regret a trial of it on a long, low, sharp schooner, of sufficient breadth to stand up under great press of sail, moulded as much as possible to combine great stability with small resistance from the water, and when in quick motion to be buoyant—especially not to dip forward—provided it could be procured not too old, and free from rot, large knots and cross-grain, a very little attention in the cultivation would afford it of the finest bends, and clean and fresh.

"From the superior lightness and elasticity of the Willow even to Larch, the lightest and most elastic of the Fir tribe, we should expect that vessels of it would outstrip those of Fir, at least of Scots or Red Pine, as much as the latter do those of Oak; and that, from its greater elasticity and lightness, they would move through the water, yielding to the resistance and percussion of the waves, compared to those of Oak, as a thing of life to a dead block. For vessel timbers this wood requires to be used alone, as, when mixed with other kinds less pliant or elastic, the latter have to withstand nearly all the impetus or strain, and are thence liable to be broken; or, from the vessel yielding more at one place than another, is apt to strain or become leaky.

"Some years ago, when demolishing an old building which had stood fully a century, the writer found the large frames of the building or ground couples, which, from their situation, could not have been renewed, to consist of this timber, and, with the exception of the outside, which was so much decayed for about half-an-inch in depth, as the finger could pick it away, the body of the wood was as fresh as at first, and fit for any purpose, and of a beautiful pink or salmon colour. When we observed the mouldering exterior of these

pieces, we laid one of the smallest hollow over a log, and struck it with a large wooden mallet, not doubting that it would go to fragments; such, however, was the resilience that the mallet rebounded so greatly as almost to leap from our hands.

"For country purposes Red Willow is employed in the construction of mill water-wheels, of the body or boarding of carts, especially of lining of carts employed in the carriage of stones, or of any utensil requiring strong, tough, light, durable boarding. Formerly, before the introduction of iron hoops for cart-wheels, the external rim of the felloe was made of Willow. When new, the cart or wain was driven along a road covered with



hard small gravel (in preference gravel somewhat angular), by which means the felloe shot itself with stone, and thus became capable of enduring the friction of the road for a long time, the toughness and elasticity of the Willow retaining the gravel till the stone was worn away. Under much exposure to blows and friction this Willow outlasts every other home timber. When recently cut, the matured wood is slightly reddish and the sap wood white. When exposed to the air and gradually dried, both are of salmon colour, and scarcely distinguishable from each other. Willow bark is used in tanning; it also contains a bitter, said to be febrifuge."

To grow Willows well for poles they must be planted closely, say 3 feet apart each way; 4,840 to the acre would not be too close for the first eight or nine years, when they might be thinned out to half that number. The thinnings would often find a ready sale for farm use. At the end of sixteen or twenty years they might be reduced to 1,210 trees, which would give them 6 feet of space each way for their full develop-

ment. The time to fell such a plantation ranges from thirty to fifty years; but whenever dead branches begin to show themselves there should be no delay in cutting down. In felling such Willows do not think of leaving a few selected trees in the hope of obtaining large timber, for after being so crowded and then suddenly exposed they would perish. If heavier timber is desired plant more openly at the first.

(To be continued.)

IN A WICKLOW GARDEN.

WE had such a good garden day with Mr. Acton on Friday last. The blue hills and roadsides beautiful with Gorse, and the low hillsides and woods, azure in places with Bluebells—acres upon acres of them, showing a mile away through the brown brake fern, along with which the tender young growths now appear. Rhododendrons not so richly flowered as usual, but still very beautiful. *R. arboreum* in great variety, single specimens and groups; one specimen 10 feet high and eighty years old—white, pink, and blood crimson forms, light up the vistas through curtains of Sycamore and the tender, young, shimmering Beech leaves all over the place. There is a splendid avenue of Rhododendrons here, great bushes 10 to 12 feet in height, all of which were rooted from cuttings by the owner's sister, and which now form one of the characteristic features of the garden. They are still in luxuriant health and vigour, covered with flowers, and the margins of the walk below are stained red and blush, or white by the myriads of their fallen flowers, amongst which the bumble bees are constantly busy in the sunshine. *R. arboreum* "Brilliant" is very fine in colour on the old bleach-green, and *R. Roylei*, *R. Thomsoni*, *R. T.* hybrid with larger leaves and flowers, *R. Keysii*, *R. campylocarpum*, *R. glaucum*, *R. saligna*, and many others, are in bloom, including *R. arboreum* ("Smith's hybrid"), a glowing mass of crimson red 14 feet high, and *R. Blandyanum* also glorious in health and colour. A Lawson's Cypress of perfect shape and vigour is 60 feet in height. The

great Cedar of Goa, *Acer palmatum purpureum*, *Andromeda formosa*, with great clusters of milk-white bells, are all very remarkable specimens. *Vaccinium glauco-album*, a very rare species, is fruiting freely, the berries being blue-black in terminal clusters amongst the dark green leaves. *Tricuspidaria dependens*, 15 feet high as a bush, heavy laden with its crimson-red buds, and the Chilean Fire-bush (*Embothrium coccineum*), 25 feet high and as healthy as a young Cherry, are worth going a long way to see. There grows here, in a sheltered and half shady spot in the open air, the finest specimen of the rare *Laurelia aromatica* I ever saw or heard of in British gardens. It is 25 to 30 feet high, and in general habit resembles the common Sweet Bay, but the leaves are more fleshy and set opposite to each other on square shoots, and are deliciously fragrant when touched or bruised. It is a native of Chili, and is sometimes called the Chilean Sweet Bay. We frequently hear Co. Wicklow called "the garden of Ireland," and certainly Mr. Acton's garden is one of the richest furnished gardens in the country. The soil and climate are wonderful; every tree, shrub, and flower looks well-fed and healthy; the foliage and growth as free and clean as in a conservatory: in fact, at Fota, Castlewellan, Narrowwater, Powerscourt, and Kilmacurragh especially, there are rare exotics, quite hardy and in perfect condition, that about London can only be grown in the great Temperate house at Kew.

F. W. B.

THE PERGOLA OR COVERED-WAY.

WELL done, there is nothing that adds more to the beauty and variety of the flower garden than a pergola, one form of which we show in an engraving from a water-colour drawing by Mrs. Mary Stevens. The pergola is more essential to southern and eastern peoples than to ourselves for its shade, and it probably



A PERGOLA IN THE RIVIERA.

(Engraved for FLORA from a water-colour drawing by Mrs. Mary Stevens.)

arose for that reason at first. In our country, in the old gardens, the native tree was often used on the covered way or alley, but that is a very poor way of making it in the presence of our riches in climbing plants, and it is even a better thing from the point of view of beauty than it is for shade. There is no other way in which we can grow many beautiful and hardy climbers so well, and we see them in every attitude, both outside and inside our covered way. These climbers, well grown, will often give us a shade even better than the old plashed alley, which needed continual mutilation to keep it in its place. The wealth of things we have now for planting on such surfaces is quite remarkable; Clematis, Vine, Wistaria, and the nobler climbing Roses alone would suffice to make most beautiful ones, and there are not a few more, even the forms of one of the Clematis (*viticella*), raised by M. Morel, of Lyons, go a long way in the adornment of such structures. A minor charm of the pergola is the variety of things of which it may be made, according to local supplies or the taste of the owner. The one we illustrate is the ordinary type of southern pergola, in which the pillars are made of any handy stone material, with a few pine or other sticks thrown over. In our country too often the supports are made of sapwood, which quickly decays and makes the pergola anything but a pleasant haunt.

In much of our country there is plenty of "stub" and other Oak which could be well spared for the pillars, and very good ones they make. Larch comes next, and this should be chosen if we want a pergola of light and elegant form. Often it may happen that a lightly supported, rather narrow pergola will look better in certain places than a large and bold one; but when we come to spaces where a large one is best, then decidedly the better way is to have 14-inch brick pillars, and sometimes a plain "stock" brick will make this best and cheapest. We may use round-cornered bricks, but the effect will rarely be better than is got by using a plain one. Brick pillars, however, would be out of place where a narrow slender-pillared pergola is required. A pergola should never be made without there is some apparent use for it, the simplest being as a shaded way from one part of the garden to another, or from the house to a main part of the garden: occasionally we have found them useful as dividing lines to separate the flower garden from its surroundings; also they may now and then be well used round the playground or bowling green. The cross timbers of the pergola should in important cases be of Oak, or Larch cleft in two, which lasts longer than round Larch, and for the smaller sticks split Chestnut, which is common enough in the south of England, or failing them, Bamboos and Oak battens.

RHODODENDRON YUNNANENSE AT GLASNEVIN.—We have received this from Glasnevin. The effect is white, though the flower is a delicate suffused lilac; it is a most charm-

ing bush and very hardy. For over a fortnight the bush has been white all over; two years ago it was the same. It is in a moist place near the pond, cold, and shaded from the sun.

LEWISIA TWEEDYI.

THIS is one of the most beautiful of Alpine plants. The thick evergreen leaves lie in a rosette on the ground : the flowers, which are nearly as large as those of *L. rediviva*, are borne in some quantity, and have in the bud the delicate pink colouring of a Tea Rose. When

shire it is a miffy plant for out of doors culture. Frost does not affect it, and some plants will flower excellently, at any rate, for a time ; but, sooner or later, they seem to develop weakness, and die apparently without any evident reason in the spring. In a frame there is no difficulty ;



C. POCHON

(Engraved for FLORA from a drawing by H. G. Moon.)

fully expanded they are of a pale straw yellow. Mr. A. J. Johnson, of Astoria, Oregon, tells me that in its native habitat it covers acres of ground, and that when all the flowers are in bloom the sight is charming. Here in Che-

the plants do well and flower freely, and they can easily be increased from spring cuttings. Probably it is the endeavour to deal with the plant out of doors which has caused it to disappear from all the trade catalogues.—A. K. B.

HIDALGOA WERCKLEI.*

THIS recent addition to the ranks of greenhouse plants, known as the "Climbing Dahlia," was discovered in the uplands of Costa Rica by Werckle in 1898, where its habitat would seem to be local. Having been placed originally in the hands of Mr. Childs, of New York, a plant found its way to Kew, with the result that its merits were soon recognised. Of rapid growth and simple culture, it is likely to become a favourite. Without going into botanical details, it suffices to say that, while recalling the Dahlia in some of its characteristics, its climbing habit and fibrous root distinguish it; the flower also, of a rich colour, is smaller in size, less regular in outline, and quite free from that stiffness inseparable from the Dahlia. The aspect of the plant is good, the elegant foliage finding its own support by clinging leaf-stalks; the free habit and outline of a Clematis, even the toss forwards of its blossoms, make it a valuable plant. Experiments, particularly in France, have already shown its usefulness. Propagated early and planted out in summer, it there makes rapid growth, blooming freely, especially towards autumn, its buds ceasing to

open only with the advent of dark days and sharp weather. Quite in the north of France it withstood several degrees of frost uninjured, until hopes were excited of its proving hardy enough to stand the winter. These hopes, however, proved futile. None the less it seems certain that in many parts the newcomer will render real service in the open garden during summer and early autumn.

On the Riviera and similarly favoured spots its future is assured, for, with some slight protection in severe weather, there is no doubt of its passing the winter unscathed. In this country, treated as *Mina lobata*, *Cobea scandens*, and other half-hardy exotics, it is more than probable that the Hidalgo will prove itself as useful as any of these older favourites. It requires a light fertile soil, and some protection from winds—the foot of a sheltered wall for choice, and there, under favourable circumstances, it will make 10 to 12 feet of vigorous growth in the season. Cuttings rooted during summer may serve as a succession in the greenhouse, and as stock plants for the spring.

J. H. B.

THE SHRUBBERY BEAUTIFUL.—I want to marry together great ranks of individual beauties, so that May flowers shall hardly be upon the wane when the blossoms of June shall flame over their heads; and June in its turn have hardly lost its miracles of colour when July shall commence its intermittent fires, and light up its trail of splendour around all the skirts of the shrubbery. I want to see the delicate white of the Clematis (*virginiana*) hanging its graceful festoons of August here and there in the thickets that have lost their summer flowers; and after this I welcome the black berries of the Privet, or the brazen ones of the twining Bitter-sweet. Or, it is some larger group with which we deal—half up the hill-side, screening some nursery of rocks—and a tall Lombardy Poplar lifts from its centre, while shining, yellowish Beeches group around it—crowding it, forcing all its leafy vigour (just where we wish it) into the

topmost shoots; and amid the Beeches are dark spots of young Hemlocks—as if the shadow of a cloud lay just there, and the sun shone on all the rest; and among the Hemlocks, and reaching in jagged bays above and below them, are Sumachs (so beautiful, and yet so scorned), lifting out from all the tossing sea of leaves their solid flame-jets of fiery crimson berries. Skirting these, and shining under the dip of a Willow, are the glossy Kalmias, which at midsummer were a sheet of blossom; and the hem of the group is stitched in at last with purple Phloxes and gorgeous Golden-rods. I know no limit, indeed, to the combinations which a man may not effect who has an eye for colour and a heart for the light labour of the culture. There is, unfortunately, a certain stereotyped way of limiting these shrubberies to a few graceful exotics, and of rating the value of foliage by its cost in the nursery.—IK. MARVEL.

* With coloured plate.



HIDALGOA WERCKLEI.

TREES AND SHRUBS IN THE SOUTH-WEST.

MR. W. D. FITZHERBERT has been recording in *The Garden* an interesting study he has made of these in the south and west. He knows much of the ground well, and both by knowledge and love of the subject is the best of guides in what is of interest not only to those who live in the extensive districts in which these plants are grown, but also over a large area in Ireland and over a vast extent of our coast lines everywhere. For while we of the more northern country are delighted to see these Cornish and Devon gardens, it is instructive to note that one of the best collections is in the north of Ireland, at Castlewellan, and we have much evidence showing that the vast coast line of our islands is favourable to many tender trees and shrubs that will not long endure the climate of the midland country, or even that of a dozen miles from the shore. The following are the notes of the more beautiful trees and shrubs only.

Anopterus glandulosa.—Tasmania. A vigorous evergreen shrub with dark, shining green leaves, bearing long, erect, terminal racemes of white cup-shaped flowers, resembling the blossoms of *Clethra arborea*, but larger. Tregothnan.

Acacias.—Australia. In Cornish and South Devon gardens many species are to be met with in robust health. *A. affinis*, very generally confounded with *A. dealbata*, is the most common. In many cases *A. affinis* is grown as *A. dealbata*. The leaves of the former are green, while those of the latter are bluish, and its flowers are less bright in colour. A group of *A. affinis*, about 35 feet in height, was a wonderful sight at Tregothnan at the end of March, being simply covered with golden blossom, which was thrown into high relief by a background of *Ilex*. *A. verticillata* is another handsome species, flowering later in the spring. It is a rapid grower, reaching a height of 15 feet in a few years, generally growing in the form of a broad based cone, with its lower branches but a foot or so from the ground. When in flower it is so covered with its pale yellow blossoms that no foliage is discernible. *A. armata* may be seen as a bush 7 feet high and as much in diameter. *A. ovata*.—This I have only seen as a bush some 3 feet high, very pretty when bearing its circular, golden flower-balls. *A. longifolia*.—Another handsome tree with leaves something like those of an Oleander, and bright yellow flowers. *A. melanoxylon*.—A fine tree. The specimen at Tresco is about 50 feet in height, and there are good examples on the mainland. Pale yellow flowers produced in profusion. Other species I have met with are *A. riceana*, *A. lophantha*, *A. calamifolia*, *A. linifolia*, *A. latifolia*, and *A. platyptera*, the latter against a wall.

Aster argophyllus.—Australia. The Silver Musk Tree, with musk-scented leaves and dull red flowers in summer. Three gardens. Height, 12 feet.

Banksia grandis.—Australia. Evergreen shrub bearing yellow flowers in dense spikes. *B. serrata*, red flowers; and *B. littoralis*. All at Tresco. *B. quercifolia*, handsome leaves with white reverse. Abbotsbury. Banksias were at one time in request as greenhouse plants.

★ *Benthamia fragifera*.—Nepaul. A strikingly handsome evergreen tree, first introduced into England in 1825, when seed was sown at Heligan, Cornwall, and where there are now specimens some 60 feet in height. It is largely represented throughout Cornwall, being used in some places as a woodland tree. In June, when the leafage is hidden by the widespread platter-like flowers of pale yellow, its effect is very beautiful, especially when thrown up by a background of green foliage. In the autumn the fruits, from which it takes its name of Strawberry Tree, some an inch or more in diameter, become bright crimson.

Boronia.—Australia. These are almost universally treated as greenhouse plants, but succeed in the open in the south-west. At Tregothnan, at the end of March, two bushes of *B. megastigma*, planted in front of a wall, the larger of which was about 3 feet in height, were coming into profuse bloom, and already scented the air with the first of their brown-yellow lined drooping cups. *B. heterophylla*, with its purple-red flowers, was also expanding blooms, and *B. Drummondii*, *B. elatior*, and *B. polygalæfolia* were also growing in the same garden.

Callistemon salignus.—Australia. There are two forms of this Bottle-brush, one bearing pale yellow flowers and the other crimson. Others are *C. lanceolatus*, carmine-flowered, and *C. speciosus*, scarlet-flowered. These grow well as bushes, specimens of the first-named being sometimes 10 feet in height and as much in diameter. There is much confusion between this genus and *Metrosideros*, *C. lanceolatus* being almost universally sold as *M. floribunda*. Callistemons are to be found in many gardens.

Camellia reticulata.—This is hardy, but rarely flowers satisfactorily in the open, except in the south-west, where it is grown both against walls and as a bush plant. It is by far the finest of the Camellias, bearing lovely pink semi-double flowers 6 inches in diameter, with bright yellow spreading stamens.

— *Carpenteria californica*.—A well-known evergreen shrub in the south-west, bearing fragrant, white, yellow-centred flowers. In some gardens it suffers from browning of the leaves; but this is apparently not the effect of cold winds or frost, as often the most exposed plants are the least affected, and the most sheltered are in the worst plight. The finest specimen known to me, about 8 feet high and as much through, is growing near Teignmouth.

Citharexylum quadrangulare.—West Indies. The Fiddle-wood. Bears white fragrant flowers. There is a fine specimen at Abbotsbury, Dorset.

Citrus trifoliata (*Egle sepiaria*).—Japan. This fiercely-spined Citrus is hardy, but rarely flowers and fruits in the north. In the south-west it flowers freely, and one specimen I know of fruits almost annually. It is 7 feet in height, and last year carried over thirty fruits.

Clerodendron trichotomum.—Japan. A deciduous shrub, also hardy, but flowering best in the south-west. The finest specimen I know is over 15 feet in height, and as much through at Greenway on the Dart.

Clethra arborea.—Madeira. The Lily of the Valley tree. Evergreen. It bears panicles of white, bell-shaped flowers in the summer, at which time it is quite a feature at Tresco. There are good bushes, the largest about 7 feet in height, at Trewidden, near Penzance.

Corynocarpus levigata.—New Zealand. An evergreen tree bearing panicles of white flowers, followed by Plum-like fruit. A healthy young plant is at Ludgvan Rectory.

Crinoaenaron Hookeri.—Chili. A handsome shrub growing to a height of 5 feet, bearing large, drooping, cherry-red, urn-shaped flowers on long peduncles, the petals being very firm in texture. In many gardens.

Daphne indica.—India. Both the white and purple-red form of this fragrant plant are common in the open in Devon and Cornwall, and in mild seasons commence to bloom in January. Some old plants have formed large bushes in front of walls.

Daphniphyllum glaucescens.—China. Evergreen. This is probably hardy, but is uncommon. The largest specimen I know is at Trewidden, and is 12 feet in height and 20 feet in spread. It has long shining leaves, the young shoots being red in colour; these, early in April, were surrounded by closely-clustered maroon-red flower-buds.

Datura sanguinea.—Peru. This grows to a large size in the south-west, often forming a tree 12 feet or more in height, and in mild winters blooming until February. *D. suaveolens* (Mexico) is probably more tender, as such large specimens are rarely seen.

Dendromecon rigidus.—California. A handsome shrub with glaucous leaves, the branchlets terminated by bright yellow Poppy-like flowers. It succeeds best in poor soil that does not induce vigorous growth. Enys.

Desfontainea spinosa.—Chili. A most distinct evergreen shrub, with leaves resembling those of a Holly. It bears tubular flowers 3 inches in length, of a bright vermilion, tipped with yellow, and is a very handsome object when in full flower. It commences to bloom in the summer, and often holds many of its

flowers until November. The largest specimen I have met with was about 8 feet in height, and was in the neighbourhood of Teignmouth. The *Desfontainea* is to be found in most gardens.

Diosma ericoioides.—South Africa. A Heath-like evergreen shrub, bearing single white flowers not unlike those of a Myrtle. Its leaves are fragrant when bruised. A healthy plant, about 4 feet by 4 feet; trained against a wall, was coming into bloom at Tregothnan at the end of March.

Diospyros kaki.—The Persimmon. China. This is hardy, but rarely fruits except in the south-west. A tree at Bishop's Teignton produced fruit which ripened well in 1890. In autumn the colouring of its foliage is very attractive.

Drimys aromatica.—Tasmania. An evergreen shrub or small tree bearing tiny white flowers in spring. Its leaves, if bitten, are very pungent, stinging the palate like pepper. The finest specimen I know is one 15 feet in height at Menabilly. *D. Winteri*.—South America. A handsome flowering shrub, bearing ivory-yellow, fragrant flowers an inch across. At Bishop's Teignton there is a good example over 12 feet in height. Both species are fairly well distributed in gardens.

Dryobalanops aromatica.—Sumatra. The Camphor tree. There is at Penjerrick a good specimen 20 feet in height.

Edwardsia grandiflora (the New Zealand Laburnum).—This and its variety *E. microphylla* bear racemes of yellow flowers, the individual blooms being 2 inches long in the first case, and about half that length in the second in the spring. Examples 10 feet or so in height are to be found in some gardens.

Embothrium coccineum.—South America. The Fire Bush. The most brilliant of all flowering trees capable of outdoor culture in this country. In May every twig is laden with clusters of long flowers of glowing scarlet, the trees presenting a most gorgeous spectacle. Every good garden in Cornwall, and most in South Devon, possess specimens, some containing a dozen or more. The finest are probably at Trewidden and Penjerrick, where they are 30 feet in height and as much inspread.

Eucalypti.—Australia. Some 30 or 40 species are grown, of which perhaps the best known are *E. globulus*, which has attained a height of 50 feet; *E. Gunnii*, 40 feet; *E. citriodora*, 20 feet, against the house at Tregothnan; *E. amygdalina*, *E. cordata*, &c. Many flower freely and bear fertile seed.

Eucryphia pinnatifolia.—Chili. A beautiful deciduous flowering shrub, bearing large white flowers like a St. John's Wort, with bright yellow anthers. A specimen at Trewidden is 8 feet in height.

Fabiana imbricata.—Chili. A very decorative, evergreen, Heath-like shrub, bearing a profusion of pure white tubular flowers clustered thickly around

every shoot. A fine example 8 feet in height is at Trellisick, but it is a common plant in the south-west.

Fagus cliffortioides (the New Zealand Beech).—A tree with minute leaves, which have given it the name of Birch in its native land. In New Zealand it is evergreen, but in this country is deciduous. A good specimen is at Enys.

Fremontia californica.—An extremely handsome deciduous flowering shrub, bearing bright yellow cupped flowers 3 inches in diameter, with orange stamens. It often remains in bloom for months. Large plants have, unfortunately, a way of dying off when apparently in good health, several fine specimens having succumbed in this manner. The finest I now know of is one growing in bush form about 8 feet in height at Newton Abbot, but the same garden contained at one time a larger example.

Grevillea.—Australia. *G. rosmarinifolia* with carmine-red flowers, forms a vigorous shrub, growing to a height of 5 feet with a spread of 7 feet. It is to be found in many gardens. At Tregothnan, *G. Preisei*, with pink and yellow flowers; *G. alpina*, red, tipped yellow, and *G. sulphurea* are grown, and I have seen *G. robusta* which had been in the open for three years. All species are evergreen.

Guevina Avellana.—Chili. A very ornamental evergreen tree, with large leaves of a deep glossy green, bearing white flowers followed by coral-red fruits the size of a cherry. There is a fine specimen at Greenway, 20 feet in height which has ripened fruit, from which seedlings have been raised.

Hoheria populnea.—New Zealand. The Houhere of the natives. Ribbon-wood, with pure white flowers and handsome foliage. Enys and other gardens.

Illicium anisatum.—Japan. A half-hardy evergreen shrub, bearing clusters of ivory-white flowers. Held sacred by the Japanese, who burn the bark before the shrines of their deities. Tresco. *I. floridanum*, Southern States of America, bearing maroon flowers. Not uncommon.

Jacaranda mimosæfolia.—Brazil. A very graceful evergreen tree with Acacia-like leaves a foot in length bearing panicles of drooping violet-blue flowers. I saw a fine young plant at Rosehill, Falmouth.

Lagerstræmia indica.—China. A handsome deciduous shrub bearing large bright pink flowers.

✕ *Leptospermum*.—Australia. *L. baccatum* and *L. scoparium* are the most generally met with. Both bear small white flowers and are evergreen. I have seen the former 12 feet and the latter 20 feet in height. Other species are also grown.

Litsæa geniculata.—Southern United States. A deciduous shrub or tree bearing white flowers in May. The largest in England is probably one at Menabilly. Twenty-five feet in height.

Melia Azedarach.—Tropical Asia. The Bead Tree, so-called from the seeds being used for rosaries, bearing much branched panicles of fragrant lilac flowers. Leaves bipinnate and deeply serrated. Rosehill. Evergreen.

Metrosiaeros robusta.—New Zealand. An evergreen tree bearing clusters of brilliant crimson flowers at the extremities of the shoots, in which it differs from *Callistemon*, whose flowers encircle the branchlets some distance below the extremities. Tresco. Thirty feet in height.

Myoporum lætum.—Australia. Native name Gu-aio. An evergreen tree bearing small white flowers and having lanceolate leaves dotted with countless transparent spots. Two mainland gardens.

Nerium Oleander.—Mediterranean. The Oleander. This is established and flowers in sheltered nooks on the mainland.

Ozothamnus rosmarinifolius.—Australia. An evergreen shrub, bearing countless minute white flowers. Sprays, if cut when the flowers are fully expanded, will retain their decorative qualities for a year. It is common in the south-west, and at Trewidden there are bushes 8 feet in height.

Photinia japonica.—Japan. The Loquat. This hardy ornamental-foliaged tree is practically hardy, and at Enys flowers annually. I believe, however, that it has not fruited. The finest specimen that I know of, 15 feet in height with a head 12 feet through, is at Saltram.

Pieris formosa.—Himalayas. This so-called Andromeda is widely met with. The finest example is at Pentillie Castle, and is 20 feet in height with a spread of 30 feet. When this is white with its clustering flower sprays it is a lovely sight.

✕ *Pinus Montezumæ*.—Mexico. A noble and distinct Pine, good specimens of which are at Tregothnan and Menabilly, where it has fruited.

Plagianthus betulinus.—New Zealand. Ribbon Tree. Bears small white flowers in clusters. A splendid example 50 feet in height exists at Abbotsbury.

Pittosporum.—New Zealand. Evergreen shrubs. *P. Mayi* at Tregothnan is about 30 feet in height, while I have seen *P. bicolor* over 20 feet, and many fine examples of *P. unaulatum*, *P. tenuifolium*, of which last a hedge has been made at Falmouth, and other species. All bear their little flowers in profusion in the south-west. The Japanese *P. Tobira* is a hardy shrub, bearing spreading flower-heads of fragrant white blossoms.

Podocarpus andina.—Chili. A handsome evergreen tree to be found in most gardens. At Penjerrick there is a specimen 40 feet in height.

Poinciana Gilliesi.—S. America. An evergreen shrub, with Acacia-like foliage, bearing clusters of

large yellow flowers with bright red stamens. The finest specimen I have seen was in the late Rev. H. Ewbank's garden at Ryde, but I know of smaller ones in the south-west.

Pseudopanax crassifolium.—New Zealand. An evergreen shrub with dark green thick leaves 2 feet in length with orange midribs. Ludgvan Rectory.

Rhapitamnus cyanocarpus.—Chili. An evergreen tree, bearing pale blue flowers, followed by violet-blue berries. A fine specimen 20 feet in height is at Menabilly.

Westringia triphylla.—Australia. Evergreen shrub, bearing blue flowers in summer. Tregothnan.

SOME KEW NOTES.

KEW GARDENS are just now very fresh and enjoyable. Azaleas, Rhododendrons, Brooms and Genistas, Bamboos, Rock Garden and borders now very interesting. Rhododendron Beauty of Tremough and Pink Pearl are noble additions, the first in great Temperate house, the second also in Cool house, but both will be fine in the South and West of England and Ireland outside. The colour of the yellow, white, orange, salmon-rose and fiery orange-scarlet Ghent, Japanese and American Azaleas is wonderful in the evening sunshine as seen with a background of fine trees and green grass. I never saw the old semi-double blue-purple Rhododendron so good anywhere before. The Alpine house is full of nice little Alpine and rock plants; but to me all the glass gardening, good as it is in its own way, seemed poor and overcrowded, compared with the open-air pictures.

Iris siberica, growing in shallow water on the fringe of the lake, is one of the finest things I ever saw at Kew. Just now—fresh and beautiful—the big beds of Flag Iris on drier ground near the lake are also good, and this is far more often the case than with the Siberian Iris. A large bed of the low-growing, sulphur-coloured Broom looks fine down near the Pagoda; in the mass it is very distinct in effect. A broad belt of *Papaver umbrosum*—scarlet-crimson with black spot—on the border of fine-leaved Vines opposite the North Gallery, is also striking just now. The trees at Kew alone are a satisfying study. Corsican Pine near the entrance, Elm, Oak, Beech, Sweet Chestnut everywhere; Poplars and Willow near the lake, and the fine old Cedars and Scots Pines near the Pagoda. I should like to have Mr. Champion and his camera there on a fine still day (or two), and I think he would get a few good studies. Justice to

Kew has, so far, never been done by any forms of pictorial art—as you are aware, the usual camera man does not *see* the best effects, and wastes his force, as a rule, on colour effects or small things. The best of things at Kew are outside the glasshouses, even outside the Temperate house, which is the best of any. I pity visitors who swelter through the tropical Orchids, Palms, and Ferns this hot and genial weather, when there is so much that is better to be seen outside in the fresh air. *Magnolia Fraseri* was beautifully in flower with its great soft leafage and flowers of tender green and cream colour, that are as delicately perfumed as some of the finest tropical fruits. Lilacs this year have been very nearly a total failure, as also some Magnolias, owing to the late frosts. Tulip La Merveille (of Vilmorin) has been, and is still, glorious in the sun. It has a stately habit and great long-petalled flowers of a fiery or flamed terra-cotta colour. In long grass it would rival even the great Oriental Poppies in splendour. Another very effective long grass flower would be *Ornithogalum arcuatum*, 4 to 5 feet in height, with spikes of pure white starry flowers. The giant Asphodel-like Eremurus are now stately and handsome in the Azalea bed, the kinds being *E. robustus*, *E. r. Elwesianus*, with their enormous spikes of soft rosy flowers, and *E. himalaicus*, with pure white flowers, of a tender green hue when in the bud. The coloured Hawthorns, Pavias, and Horse Chestnuts, Laburnum, British Guelder Roses, and Japan Viburnums are all now attractive, and the hardy Orchids, Primulas, Rockfoils, Meconopsis, Globe Flowers, and Sun Roses in the Rock Garden are just now at their best and well worth seeing.

F. W. B.

June 5th, 1903.

THE AMERICAN ELDER (*Sambucus canadensis acutiloba*).

THIS is a common shrub throughout the State of New York. Were it less familiar it might well take rank among ornamental shrubs on account of its showy white cymes, as well as



AMERICAN CUTLEAVED ELDER.

its brilliant ruddy fruit, from which a domestic wine is still made by the country housewife. The most ornamental of the common native

species is, perhaps, *S. pubens*, occurring in the Alleghany mountains—with its large, loose panicles of bright scarlet berries. Other well-known forms in cultivation are the variegated-leaved (*S. variegata*), the golden-leaved (*S. aurea*), the black-berried or medium-sized European species (*S. nigra*), the fern-leaved (*S. heterophylla*), the cut-leaved (*S. laciniata*), the round-leaved (*S. rotundifolia*), the pyramidal (*S. pyramidalis*), the cut-leaved golden (*S. plumosa foliis aureis*). To these should be added a new native variety, the cut-leaved American Elder (*S. canadensis acutiloba*) just introduced, a decidedly novel and highly ornamental shrub, surpassing the cut- and fern-leaved sorts. Perfectly hardy, graceful in habit, easy of transplanting, a rapid and vigorous grower, and of marked beauty in its delicately-cleft dark green foliage, it will form a fine companion for the cut-leaved Sumach, and add a new grace-note to the park and garden.

THE TREE LEAF.—We, who live for ourselves, and neither know how to use nor keep the work of past time, may humbly learn—as from the ant, foresight—from the leaf, reverence. The power of every great people, as of every living tree, depends on its not effacing, but confirming and concluding, the labours of its ancestors. Looking back to the history of nations, we may date the beginning of their decline from the moment when they ceased to be reverent in heart, and accumulative in hand and brain; from the moment when the redundant fruit of age hid in them the hollowness of heart, whence the simplicities of custom and sinews of tradition had withered away. This lesson we have to take from the leaf's life. One more we may receive from its death. If ever in autumn a pensiveness falls upon us as the leaves drift by in their fading, may we not wisely look up in hope to their mighty monuments? Behold how fair, how far prolonged, in arch and aisle, the avenues of the valleys; the fringes of the hill! So stately—so eternal; the joy of man, the comfort of all living creatures, the glory of the earth—they are but the monuments of those poor leaves that flit faintly past us to die. Let them not pass, without our understanding their last counsel and example; that we also, careless or monument by the grave, may build it in the world—monument by which men may be taught to remember, not where we died, but where we lived.—
JOHN RUSKIN.

“SCIENTIFIC” CONTEMPT.

THE habit of some self-styled scientific men of despising all work but their own is admirably hit off in the following letter to *The Times* by Sir Frederick Bramwell. Unhappily, this shallow and insolent contempt prevails in many walks, and horticulture is not exempt from it. For instance, the Horticultural Society has a Scientific Committee as distinct from its practical ones, as if real science (*i.e.*, knowledge) and sound practice were not the same.

“On Friday evening, Mr. Herbert Hall Turner, F.R.S., Savilian Professor of Astronomy in the University of Oxford, delivered a discourse in the Royal Institution, in which he, very properly, put forward the claims of pure science, but, to my mind, as improperly, branded those who applied science to some purpose of ordinary use, and of profit, as suffering from “vulgarity of mind,” while, however, admitting that the conditions of life were rendered easier and better by reason of such application. The discourse was entirely taken up with astronomical discoveries arrived at by the agency of photography. I wonder whether it ever occurred to Professor Turner that, if the pure science of optics and the pure science of chemistry had been left by their students in the condition of pure science, photography would have been non-existent, and that the professor’s astronomical results would, for the greater part, have been non-obtainable; and I also wonder whether it ever occurred to him that the telescopes which he uses were the outcome of the work of the engineer. . . . Lord Kelvin was aware that, by means of electric wires, electricity could be conveyed

from one continent to another, and that it might be made to agitate some very small object on one side of an ocean, in obedience to impulses received from the other side. Now this was pure science; but it was useless. Fortunately for the world, Lord Kelvin had a “vulgar mind,” and he set himself to consider how these purely scientific facts could be made useful. He speculated as to how the practically invisible movement of the small object could be made visible. The obvious way was to apply a material lever to the small object; but Lord Kelvin knew that this would not do. He knew that the inertia would make it unfit for rapid and definite motion. But he did not give up the problem. He said, ‘I must find a lever which will weigh nothing,’ and he did so; he used a beam of light. Marconi knew of ‘Hertzian waves,’ but he was not content with that pure scientific knowledge. He had a ‘vulgar mind’; and he set himself to apply his facts to a useful purpose. I wonder what the opinion of all those on board a ship near the coast in a dense fog, warned of their position by Marconi’s application of science, would be as regards his ‘vulgarity.’ This lofty contempt of the pure scientist for him who applies science is by no means new. It was evoked by Wheatstone’s application of electricity to telegraphy, and it has been repeated more than once. It may, perhaps, surprise Professor Turner to hear that there are those who look upon astronomy itself as not being a pure science. It is said that a most distinguished mathematician complained of a colleague that he had ‘prostituted the science of pure mathematics by applying it to the service of astronomy.’—FREDERICK BRAMWELL.”

THE COLUMBINES, WILD OR HYBRIDISED.—Those who at this season are happy enough to see the wild kinds of the Columbine in flower may well wonder at the confidence which makes raisers call their hybrids “improvements!” As compared with the wild kinds they are for the most part mean and ugly things; but there has been so much talk about “Darwinism” and “evolution” that many

think our finest garden things have come since the days these blessed words were used and through human agency. But, in the case of the Columbine, the palm of beauty is with the natural species, and great beauty it is. The misfortune is that the wild kinds are so quickly crossed with others that we lose them, and nothing is more desirable than to keep the wild species of Columbine true.

THE GARDEN BEAUTIFUL.

HOME LANDSCAPE AND HOME WOODS.

WATER.

WE must take good examples wherever we find them, and here is a garden scene sent us from New Zealand, which has some good points about it, as to the use of right vegetation in such places. The Weeping Willow seems even more at home there than in some parts of our country. It is curious that over a large part of England this tree should be absent, no doubt owing to some delicacy of constitution, as thousands have been planted. They

Willows, Dogwood, and Poplars—and these trees embrace a wide range of variety. In getting away from them to the variegated or other choice shrubs nine times out of ten we go wrong. Waterside planting should consist mainly of waterside trees, shrubs, and plants, the form of graceful painted leaves, and the habit and colour of the trees and shrubs being those best of all for the situation. And we cannot do better than follow this by printing



RIVERSIDE PLANTING. (*Engraved for FLORA.*)

seem to thrive best near the sea and in sheltered gardens near the coast. Happily there are now other Willows, which in a northern country may take the place of these, such as the Weeping Yellow Willow. Waterside planting demands its own natural vegetation more than any other planting. Throughout the whole of the northern world there are trees and shrubs which frequent the waterside—

the observations of Thomas Whately, one of the best writers on water: “Considering water merely as an object, no other is so apt to seize and fix the attention. In a garden, water is generally imitative. That which in the open country would be called a great pond, here assumes the name, and should be shaped as if it had the extent of a lake; for it is large in proportion to the other parts of the place.

Sometimes a river passes through a garden, more frequently the semblance of a river only; but in either case, the distinctions between a lake and a river should be preserved.

"**THE LAKE.**—Space is essential to a lake; it may spread to any extent, and the mind delights even in its vastness. A lake cannot be too large as a subject of description, but the eye receives little satisfaction if form be absent; the ocean itself is always most agreeable, when, at no great distance, a reach of shore, a promontory, or an island, reduces its immensity into shape. A lake whose bounds are quite out of sight disappoints the eye and confines the imagination; it is but a waste of waters, neither interesting nor agreeable. If the length of a piece of water be too great for its breadth so as to destroy all idea of a lake, the extremities should be considered as too far off and to given proximity; while at the same time the breadth may be favoured by keeping down the banks. On the same principle, if the lake be too small, a low shore will, in appearance, increase the extent. But it is not necessary that the whole scene be bounded: if form be impressed on a considerable part, the eye can even be pleased to observe a tremulous motion in the horizon, which shows that the water has not there yet attained its termination. Still short of this, the extent may be kept in uncertainty; a hill or a wood may conceal one of the extremities, and the country beyond it, in such a manner as to leave room for the supposed continuation of so large a body of water. Opportunities to choose this shape are frequent, and it is the most perfect of any: the scene is closed, but

the extent of the lake is undetermined; a complete form is shown-leaving a wide range to the imagination. Satisfaction depends upon the outline, which is capable of exquisite beauty; and the bays, creeks, and promontories forming part of that outline, together with the accidents of islands, of inlets, and of outlets to rivers, are in their shapes and their combinations an inexhaustible fund of variety. A straight line of considerable length may find a place in that variety; and it is sometimes of singular use to prevent the semblance of a river in a channel formed between islands and the shore. But no figure perfectly regular ought ever to be admitted; it always seems artificial, unless its size absolutely forbids the supposition. A semi-circular bay, though the shape be beautiful, is not natural; and any rectilinear figure is ugly. But if one line be curved, another may sometimes be almost straight; and to multiply the occasions of showing contrasts, may often be a reason for giving several directions to a creek, and more than two sides to a promontory. Bays, creeks, and promontories, though extremely beautiful, should not, however, be very numerous; for a shore broken into little points and hollows has no certainty of outline; it is only ragged, not diversified; and the distinctness and simplicity of the great parts are hurt by the multiplicity of subdivisions: but islands, though the channels between them be narrow, do not so often take from greatness; they intimate a space beyond them whose boundaries do not appear, and remove to a distance the shore which is seen in perspective between them."

THE VIGOUR OF THE BRAMBLE.—Sometimes it is asked how to establish the Bramble as covert; but, in our own case, and many others, how to prevent the Bramble from disestablishing everything else is one of the most hopeless questions we have to deal with. No matter what one plants—the strongest evergreens or bushes—this slow but too steady encroachment of the Bramble is depressing to see; it covers everything, except trees, in an armed embrace, and one sees the Sweet Briars and Rhododendrons disappearing under the Bramble as under water. The question is, whether one could not make use of this extreme vigour, and find out and cultivate some of the more useful forms among the British Brambles—for the common idea that we

have only one is quite a mistake. There are numbers of Brambles in Britain which botanists dispute about a good deal, but, whatever we may think of their arguments as regards varieties of species, there is no doubt that in fruit and appearance many of them do differ essentially. The one that has come most into gardens is the cut-leaved Bramble; it is an excellent fruit if it gets as fair a chance as other small fruits. If anyone would take the trouble to treat our wild Brambles as the Americans have done theirs, it is very likely we should come into possession of some excellent small fruits. The American kinds which give so much and excellent fruit are simply cultivated forms of their native Brambles.

EFFECTIVE WATERSIDE PLANTS.

THERE are a certain number of stately plants in our gardens, and among the hardiest and finest in form, which within the limits of the many of them do not flower conspicuously, they would take the place the continuous bloomers should have. There is nothing more



THE GREAT-LEAVED WATER DOCK.

(Engraved for FLORA from a drawing by H. G. Moon.)

garden proper, or even near it, it is sometimes difficult to find a place for. The danger is, that they will overrun other things, and, as effective than some kinds of Rheum, either in foliage or in flower, but they would be out of place in most gardens ; and so it is with many

other hardy plants of fine form. Where, as so often occurs in country places, there is any kind of water, artificial or natural, there we shall find the best home for them. Some, like this noble, wild, and native Dock which we illustrate, cannot be grown anywhere else. And this is true of most of our native waterside plants; they want water, and, moreover, they want the rich soil that has been gathered beside water from the action of stream or river, or the decay for ages of soil and leaf. In such a place we may put plants without the usual wearisome routine of the garden, that is to say, they are so vigorous that they will take care of themselves and settle matters with the wild plants near. It is not only a comfort to have got rid of the ceaseless trouble of keeping the plants free of weeds, &c., but the effect is better if they are let alone, and any stout

weeds, sedges, or grasses coming near only add to the good effect. In such places the only thing we have to think of is good grouping, so that each kind may be held together and seen to the best advantage.

It will be understood that this refers entirely to free-growing things that can take care of themselves in any rough waterside places, such as Rhubarbs, Cow Parsnips, Giant Knotworts, Giant Meadow-Sweet, Goatsbeard, perennial Sunflowers, or any coarse perennials thrown out of the garden. Such waterside effects should be considered quite apart from those that might be grown in carefully kept ground where we might have our Irises and marsh plants. Some of the larger ferns, however, like the Royal Fern and Giant Horsetail (*Equisetum maximum*), would be quite able to take care of themselves among bolder plants.

THE HARDY CATALPA (*C. speciosa*).

ONE of the most interesting discoveries of our own time in trees is that of the greater Catalpa, which is distinct and more of a forest tree than the old Catalpa so well known in London, and, indeed, often planted in old London gardens, as fine specimens may still be seen in the suburbs and some of the outer streets. In some ways there is much difference between the two trees which was not noticed at first, even by planters in their native country, but eventually the difference has been made clear by Dr. John A. Warder, of Ohio, editor of the *Western Horticultural Review*. The hardy Catalpa is so far taller than the old Catalpa, which does not grow beyond 50 feet high, that it sometimes reaches over 100 feet in forests, although in open planting not nearly so high. Here we have tried it only as an ornamental tree, but the Western Americans have recently begun to look at it from an economical point of view, and that is its use as an enduring timber for railway ties, of which many millions are used there. We have planted it in England, though not very successfully, not knowing its natural habitat, and on poor, cold upland soil, while it naturally grows in rich bottoms and alluvial soil by streams and rivers. In our country, with a weaker sun-

light, it is all the more necessary that the tree should be planted in free rich soil near water, or in very rich moist soil. We shall be very glad to hear from any of our readers how it has succeeded in their case. It is important to get the true tree, because hybrids and trees of the old Catalpa have not seldom been sent out instead of it. There is a full and interesting account of the tree in the Bulletin of the Kansas State Experimental Station, No. 108, 1902, from which the following conclusions are taken:—

HISTORY.—Two species of Catalpa are native to the United States: *C. catalpa*, indigenous in the south-east, and *C. speciosa* in the central west. Planting of the south-eastern species in the west long caused confusion between the two trees, since both were planted together indifferently, under the supposition that they were of the same species. The low, scraggy habit and the tendency of the tops to winter-kill, peculiar to *C. catalpa*, was a supposed characteristic of all Catalpa trees. *C. speciosa* is distinguished from the other native species by greater stature, hardiness north of the forty-fourth parallel, north latitude; larger flowers, fewer in panicles, and appearing about two weeks earlier than those of *C. catalpa*; by

furrowed rather than scaly bark ; by wider and more deeply notched seeds, bearing a fringe of hairs not drawn to a point, as in *C. catalpa*.

DURABILITY.—Wood of *C. speciosa* is remarkable for durability in contact with the soil. Well authenticated observations give life-record of one hundred years for timber from large, mature specimens. Seasoned timber from trees 10 inches or more in diameter will last fifteen to thirty years in continuous contact with the soil.

CULTURE.—Seed sown about twenty-five to the foot, in shallow drills one inch deep. Spring sowing best in Northern states. Seedlings "heeled in" over winter, and set permanently following spring. Planting should not be closer than 5 by 8 feet. Thin to 10 by 8 feet from the eighth to twelfth year. Thinning continued until trees stand 20 by 16 feet, or 16 by 16 feet if original planting was 8 by 8 feet. Crops of corn, etc., can be grown between eight-foot rows first year after setting. If cut to ground second year from setting, and single sprout allowed to grow, resulting trunk will be straighter than if not cut back. Sprouts from older roots produce post timber in four years. Pruning necessary for formation of straight trunks—first pruning in fifth or sixth year ; second in the tenth year. Trees in forest increase in diameter from one-third to one-half inch annually, if not planted closer than 5 by 8 feet (1,000 trees per acre). Trees standing 16 by 16 feet (170 per acre) may increase in diameter 1 inch annually up to about twelfth year. From that time on, probable annual rate of increase will be one-half inch. Post timber produced in from seven to ten years ; tie timber, telegraph and telephone poles in from fifteen to twenty-five years.

NEED OF TIE TIMBER.—White Oak, the best tie timber hitherto used, nearing exhaustion. Expense of chemically treating cheap ties of perishable wood is great. Metallic ties are out of the question on American road-beds. Strong demand exists for durable tie timber to replace Oak. In 1900 there were 535,668,000 ties in track in the United States. If laid with Catalpa ties, annual renewals would not exceed four per cent., counting life of Catalpa ties at but fifteen years—they have been known to last twenty years. Annual saving of expense of renewals thus affected, estimating the cost of Catalpa ties also at forty cents apiece, \$10,600,000. Durable quality of Catalpa renders it especially valuable for fence-posts and for telephone and telegraph poles. Value for post timber lies not only in its resistance to decay, but also in its not checking or splitting with age. Farlington plantation, near Farlington, Kan., owned by the 'Frisco Plantation system, has 640 acres, planted between 1879 and 1882. Trees planted 4 by 4 feet. Not regularly thinned or pruned ; consequently trees have not made proper development. Thinning now going on and plantation may yet be successful. The Tincher plantation of sixty acres, near Wilsey, Kan., is successful and promising, producing in some parts of the plantation 2,000 posts per acre. Trees well pruned and properly thinned. Soil, upland prairie. The Yaggy plantation, situated in the Arkansas river valley, near Hutchinson, Kan. About 500 acres in trees. Conditions of this plantation better adapted for growth of Catalpa than those of any other in the state. Trees in splendid condition, and the plantation a decided success, with fair profit and a good and lasting annual return from the plantation.

DEATH OF TREE PÆONIES.—M. Dessert, the French grower of these plants, replies in the following terms to a query under this heading : "The loss of your Pæonies is not due to the grafting as you imagine. All our plants, young and old, are grafted, and we have not lost a single plant from that cause. Without doubt your plants have been attacked by a parasite, probably a sort of *botrytis*, a near relation

of *Botrytis cinerea*, the ravages of which in the neighbourhood of Paris and Orleans French nurserymen have reason to regret, and which has had a disastrous effect on the stocks of *P. officinalis* in American nurseries. This fungoid attacks the exposed parts of the plants only, the roots remaining untouched and sound, and it is probably this that makes you attribute the blame to the grafting."

SOWING WOODS.

THE rapid way in which trees sow themselves in our woodlands might lead people to think of the advantages of sowing the seeds of some trees direct. Perhaps in planting with Pine an arable field in which a tree has not grown for ages, among the young Pines we may find in a few years' time numbers of Ash trees also, and perhaps clean young saplings of the native Oak brought thither by squirrels, rats, birds, or mice, which may one day take the place of the Pines. The Scotch Fir sows itself rapidly in certain heaths and rough lands in Surrey, Devon, and Hants, and many other places; Larch we have seen come up on poor soilless railway banks. Sycamore comes up as thickly as chickweed, and, though not a popular tree at present, is really a valuable one in many ways, both for its timber and also as a seaside tree. Chestnuts are more easily raised from seed than in any other way, by dibbling in the fruit. The squirrel, long-tailed bank mouse, the bank vole, the jay, and the rook are among the living things that bring and scatter the seeds of Oak and other trees for us. Our reasons for sowing are various; plants for forest purposes are not easy to get in many districts, in the rough state, and there is a way of planting trees too large, which is fatal to success. As the ordinary nursery does not everywhere lend itself to the cultivation of forest plants in the best state for woodland planting, growers very often have to apply to others for them, and hence there is a double movement of the plants, often to their injury. Unless, moreover, the ground and labour are ready, the plants sometimes suffer after getting home.

The best results are from little trees, say under a foot high generally, but during hot years, in the southern and midland counties, failures are common, even of sound little trees. Planting as usually done is expensive. This is especially so if the work is not organised by an expert woodman, who knows what it ought to cost and how promptly planting should be done. No doubt we shall have to wait for results, but every art has its routine way, which, when looked into sometimes, is not always the best way for the purchaser, and is often nothing more than a trade convenience. In any case, sowing trees is a most interesting way, and also the natural way. Our experience is much in favour of seedling trees as against planted trees; and we advise those who have poor fields of ground to sow them with tree seeds, getting sound seed, and from good sources. The sowing of trees may be done in different ways according to the soil, the trees chosen, and the labour at our disposal. It may be done broadcast, and not a bad way in good Oak land is to scatter acorns over the ground and then run a light plough over it, which throws them into lines and also preserves the acorns from their numerous enemies during the winter. Acorns may be dibbled with success in the underwood also. Chestnuts may be planted in the same way. Larch and Scotch Fir we have successfully grown broadcast, but where there is time and labour to spare these might also be sown in lines. Bare rocky surfaces may be sown broadcast. These remarks apply to native trees and such hardy forest trees as readily take to our climate.

A GIANT HONEYSUCKLE (*Lonicera Hildebrandiana*).—Visitors to the Drill Hall, Westminster, at a recent meeting of the Royal Horticultural Society, were interested in some flowering branches of this plant shown by Messrs. Paul, of Cheshunt. Found in the Shan States of Upper Cochin China, it proves quite at home in a cool greenhouse, where its growth is rapid. I have seen a plant of *L. Hildebrandiana*, bearing only six leaves, planted in rich light soil at the base of a small Pine tree upon the Riviera, and in two years its long pendant

branches formed a festoon at the summit, while during the third season it bloomed freely, the main stems being already the thickness of an old vine stem. The flowers, sparsely clustered, are about 5 inches in length, the tube very long, and the throat small; the colour is at first creamy-white, then yellow, shading to orange before the blossoms die away; very fragrant. In its native country it covers trees with rope-like stems. Its culture is perfectly simple, as is also its propagation by layers.—J. H. B.

FLORA

AND SYLVA.

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[Monthly.

THE GARDEN BEAUTIFUL.

HOME LANDSCAPE AND HOME WOODS.—LOST EFFECTS.

IN passing by a steep slope of ground in a beautiful valley in Sussex lately we noticed it was clad with old Oak and Larch, the ground being such as one could not plant in any better way, and the effect the best that could be got. But, by some misguided idea of false landscape gardening, men were cutting down most of the trees and destroying all the stately and dignified effect of the wood, with the view, clearly, of making some kind of pleasure garden—in fact, part of the steep slope was already planted and dotted with the usual Copper Beech, Syringa, Pampas, and any shrub that would make a dot, arranged in such a way that, from first to last, no good effect could ever arise from the spot. Now there is good and bad landscape gardening, and some may ask what ought to be done. The right way would have been to have kept the trees, or the best of them, in a grouped and dignified way, with open walks of the easiest gradients, and to have planted beneath the trees groups of Azaleas, Rhododendrons, or other shrubs, as it is a mistake to suppose that these will not grow in shade and partial shade

as well as they will in the open. At the same time was going on the fatal and stupid mistake of isolating the trees so as to get the “specimen” look which spoils everything to the artist. Occasionally a specimen of a very fine tree is admirable in a park, but by far the best way is the grouping one, which by no means involves the weedy way. Planters in seeking to avoid the scraggy tumble into the commonplace, while artists and those who look for form see the error at once, because their work is to study and draw form. With poets too, it is the same, from Horace, with his true observation of the effect of Willows, to Tennyson, with his “Olive-silvery, Sirmio.” Here we are not trying to make any distinctions in the common pseudo-scientific way between artists and poets and other people, but rather to show the unity of natural and picturesque ways with the views of the poet and artist. From the variety of form occurring in one tree we may judge how much the trees of the northern and temperate regions of Europe, Asia, and America may influence the beauty of a landscape, and how much we have

to learn who would deal with them rightly. The art of planting trees with good effect is of far greater importance than the question of the mere divisions and plans of the ground round a house. I never had a true idea of the beauty of a Birch wood until I saw woods in Northern Germany, massed as wood, with nothing to be seen but silver stems. Trees vary with every condition of altitude, soil, and climate ; and the only way of knowing them is the actual study in many different places, not only of their cultivation, but their arrangement. Take the common pinetum as seen in many country places. An acquaintance with the Pine woods of the northern world should save us from the weak way of planting each tree, set out by itself as a "specimen." Even worse is it when, instead of keeping these Pines in the pinetum, they are scattered about the foreground of the house, and some of the finest houses in England are marred by scattering Pine trees in the foreground. The conical shape of the conifer, always ugly as compared with the trees of our own country, is only natural to them when young. Of the many questions which the landscape planter has to face that of the forms and grouping of trees is the most important. A knowledge of them is absolutely needed in pleasure grounds, parks, and woods ; not only the ordinary plantation or shrubbery of the country, but also in long-established woods. This knowledge is not only essential for good planting, but also from an artistic point of view. Nor must it be confined to one aspect only

of even our few native trees. Take the Oak : how mistaken anyone might be as to its planting who knew only one expression of its beauty ! The Oaks in the country south of London are quite distinct in aspect from those of Warwickshire. Yet the Oak, set close in a Sussex wood, with many silvery columns rising out of Primroses, is as beautiful as any of the fine Oak growths of the Shakespeare country. And this is but one example of the variation of habit of one tree, showing the need for the study of trees in Nature, and not in books. If we travel in mountainous lands where Pines abound, we find that they grow close together, that the "extinguisher" is not their true form, and that they shoot up into handsome stems, often over 100 feet high without a branch. It is a delusion to suppose that there is anything old or right about the common mode of planting conifers, as most of them are recent gains. Thinking of all this, how common it is in the first place we go into to see nothing but the muddle-mixture of trees and shrubs from all countries and elevations and all characters jumbled together in one plantation, exactly the best thing being done to steal away all character and distinction and even good cultivation ; for, eventually, the coarse things destroy the others, and the good and rare things have little or no chance, while the eye cannot see the real beauty of the forms or even colours of things, the common way destroying good colour as well as form. We may see the *Wellingtonia* planted near a window, and trees planted in conditions in which

it is impossible for them to thrive to any good effect; and when we consider the many beautiful hardy trees and shrubs in our islands it is no wonder that men, busy in other ways, should make many mistakes in planting. But on the part

of professional planters, so unmeaning a way should not be accepted; and the true one is unattainable without a knowledge of the loveliest gift of Nature to the earth—its trees.

PLANTER.

THE GREATER TREES OF THE NORTHERN FOREST.—No. 5. THE SCOTCH FIR (*Pinus sylvestris*).

THIS is our native Fir, and the best we shall ever see in our land, taking its beauty as well as its use into account. As we usually grow it soft and sappy in our rich soils and very often too openly, we find that the wood is of little value; yet grown in the plains and mountains of the north in the natural way, or in managed forests, it is a wood of the highest value. As to beauty, there is nothing to come near that of old trees, if grouped or massed as they should be. My first idea was to give a complete account of the Scotch Fir, but its literature, I found, would take more than a whole number of FLORA to do it justice, and it is so well known that there is less need of detailed description than in the case of rarer trees. I have been for years looking for a good drawing of the Scotch Fir—not difficult to find, one would think; but I had to wait long for one worthy of the tree, and at last found it at Christie's in a drawing of William Müller's; an astonishingly strong and clear study, both in drawing and grouping, as may be seen in the engraving. It will perhaps suggest, among other things, how much has been lost to English art by the early death of this landscape painter. There has been much talk in the past of the varieties of the

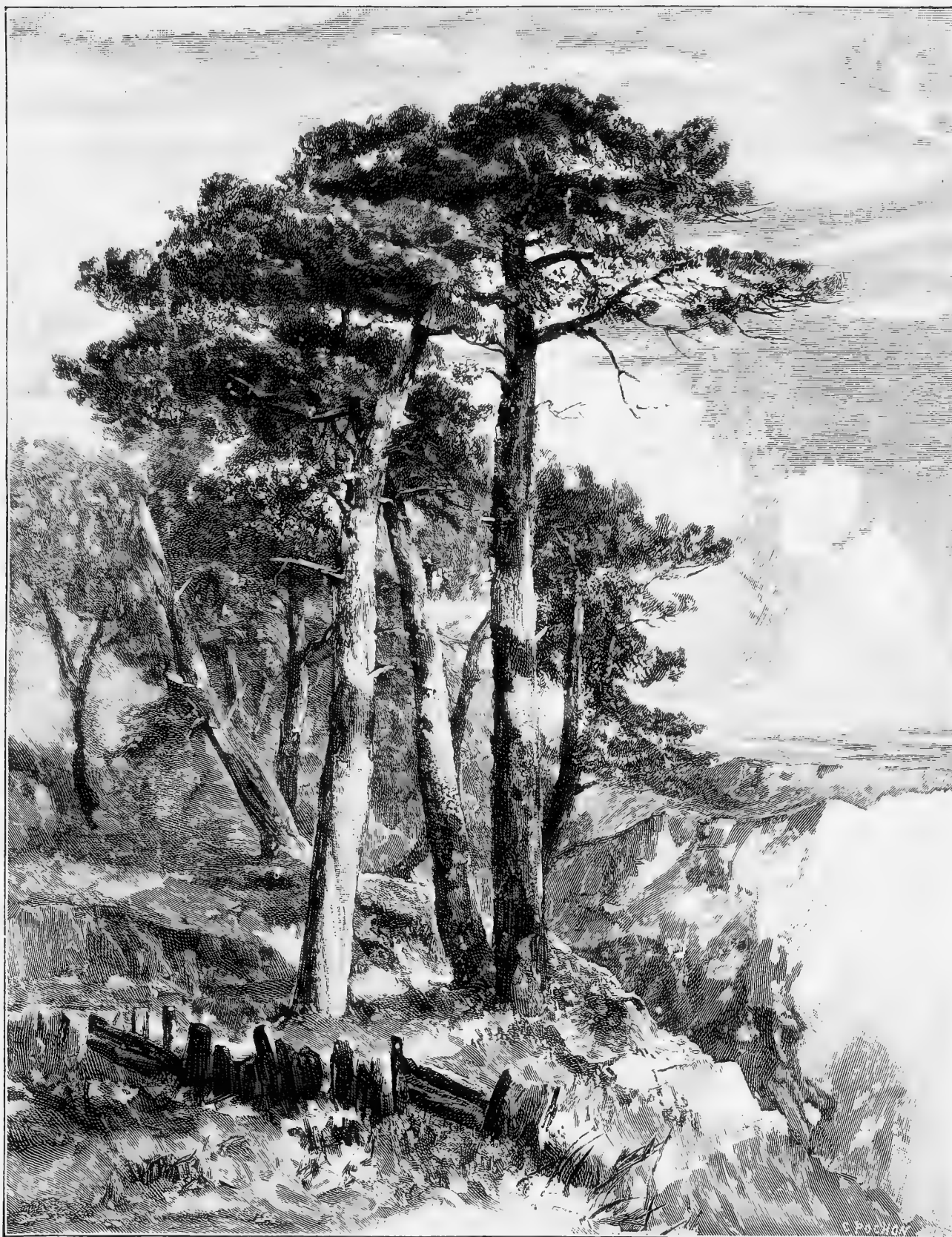
Scotch Fir, and many vain attempts have been made to define them; but, in the opinion of experienced planters, these are more the effects of climate and varied conditions than any real distinctions of kind. The area inhabited by the tree is so vast, that it embraces climates of the utmost diversity. The best wood and the finest grain of the tree is met with in northern Europe and Asia, where time does not count, the growth is slow and excellent, insects are absent, owing to the severity of the climate (except for a short season), and a long winter rest is followed by a regular summer growth. When raising young plants, therefore, it would be a mistake not to go to the best sources for seed; that is to say, countries where these Pines are most famous for their size and quality. The trees from central Europe are, there is reason to think, less valuable than those of Scandinavia and northern countries, Russia, Finland, and Scotland included, where the trees are taller and better; whether or not owing to climate does not matter. Enormous quantities of this wood are sent from the northern ports of Europe to other countries, the best coming from Dantzic and other ports in the North. The range of this Pine over Europe and Asia

is very wide, and forms from west to east a long zone, embracing more than a third of the northern hemisphere, from Spain up to and beyond the Lena. The southern limit of its range reaches the Sierra Nevada, and its polar limit is a short distance beyond Cape Nord, in Lapland. Within this area its distribution is very irregular, diminishing from the N.E., where, by itself or with other races, it forms immense forests. Within its northern area the Scotch Fir is a tree of the plain; under the 70th degree of latitude it is never found at a greater height than 681 feet, but as one goes south it is seen at higher altitudes, thus, in the Vosges, at 2,700 feet; in the Cevennes 3,300 feet, in the Pyrenees 6,000 feet; and as it rises it quits the plains and hill-sides never to descend (spontaneously) below a certain limit. It is, therefore, a tree of the mountains over a great part of its area. It thrives best in situations sheltered from the more violent winds, in a clear atmosphere, and on southern exposures.

In the plains, deep, cool, sandy soils and loams suit the Scotch Fir best. On the warmer slopes it grows well even in sand, where no other species would thrive, on condition, however, that the subsoil contains sufficient moisture for its wants; and it will even thrive in peat soils with the exception of very acid peat. Chalky hills and plains are unfavourable to it, the soil and subsoil of such places being impermeable and at the mercy of the summer droughts. On the mountains, however, it does well in sandstone, granite, basalt, schist, and limestone, and is un-

affected by the mineral elements in the soil, so long as it finds the coolness that is necessary to it. It is useful for planting waste lands, arid slopes of southern exposure, and forest heath lands.

Of its wood, Mathieu ("Flore Forestière") says:—"The sap wood and the heart wood are clearly marked in the Scotch Fir. The first, which is yellowish and of bad quality, varies much in thickness according to the age of the tree, the soil, and conditions of growth. It is especially abundant in trees of vigorous growth in rich soils, and may, in fact, form the whole substance of the tree up to a fairly good age. The heart wood, which alone is of value, is rosy red or russet. The resin ducts are numerous and most strongly marked longitudinally. The turpentine, which is fluid in the sapwood, and flows freely from incisions, becomes hardened into a brown resin in the heart wood, of which it more or less impregnates the tissues and ensures their great durability. No wood is so good for the masts of ships, seeing that in addition to its dimensions it has elasticity and lightness, great resisting power and endurance. To fit it for this purpose, however, the stem should be straight and slender, free from knots, formed of equal annual growths, and perfectly seasoned. It should also be resinous to ensure durability, yet not so much so as to make it heavy and brittle. The northern climates with their short period of vegetation, long days and regular seasons, are the only ones which produce timber suited for this important purpose. The wood is as enduring as that of the best



THE SCOTCH FIR (PINUS SYLVESTRIS).

(Engraved for FLORA from a drawing by Wm. Müller, in the possession of the Editor.)

hardwood trees and is much used for beams and planks in building; it splits well, is excellent for telegraph posts, props and woodwork in mines, &c. It varies extremely in density and in quality. As a fuel it is less valuable than the best hardwoods, but is better than some of the other Pines, and the roots are excellent fuel in closed furnaces." The last thing to say about this precious Fir is, that we should never thin it in the usual scattered British way, in which every tree stands out by itself like a maypole on a green. The trees, like most of the Pines, stand like soldiers shoulder to shoulder in their natural condition, and so they should be in the cultivated state, if we look for

timber or even beauty. The Scotch Fir in England, dressed all down with branches, rarely attains the dignity of a Pine. Another mistake is planting too thickly. I have often seen the trees—I do not know for what reason—planted 15 to 18 inches apart. They should never be planted closer than four feet, which gives the young tree a chance of growing sturdily. They should be thinned in time, but never so as to let in the sun, or allow the grass to grow about them. The proper way is to creep in under the wood when it is grown up and take out the weakest trees, *always preserving the leaf canopy overhead.*

* * *

NUTLEY.

NUTLEY was the late Mr. George Roe's place, well planted long ago, and improved by Fraser, Niven, and others, and with its lawns, park, good trees, and mountain views is charming; one long border, 150 yards or so, along a straight and handsome brick wall, covered with choice evergreen and flowering shrubs, was as fine as ever I saw one—filled with great groups and clumps of all the best old things—Iris, Pæonies, Oriental Poppies, Asphodels, Lupines, Stocks, Alyssum, Aquilegias, Foxgloves, and many other well-grown things, every one of them seemed proud of the soil, climate, and shelter a good and common-sense gardener had allotted them. Tree Pæonies, fifty or sixty, perhaps more, years old, were superb, 6 feet high and much more, though weighed down by great rosy flowers. These are on the grass, and look all the better for it. The Arum Lilies (*Richardia*) do well here in a Reed- and Iris-fringed lake with Water Lilies near them, and wild fowl breeding along the rushy banks. To see them rise and whirr away over the trees and the park, in which Jersey and Hereford cattle graze, is quite like being in a bit of open country, and only about five minutes from the

lawn and house. The prize Herefords, which took three cups at R.D.S. Spring Show, and the gardens, inside and out, are managed by the same man, and he can grow grapes and tomatoes and decorative things of the best. Creepers cover the wire-trellised sides of the house, Jasmine, *Pyracantha*, *Ceanothus*, *Honeysuckle*, and *Roses*, trained by the same hand that wrote so ably and sympathetically of our English master, William Silence—who dearly loves his fine and well-stocked old garden. On the irregular lawn are great beds of beautiful things, Wall-flowers, Stocks, *Roses*, sweet-scented *Pelargonium*, Tree Pæonies before-named, and bosky clumps of shrubs, and several very fine trees—a fine *Robinia*, Cobbett's Locust tree, has a noble netted trunk and a great green head of leafage as tender in hue as maiden-hair fern. Beneath it a large bed of scarlet Oriental Poppies show like fire in the lowering sun. Shelter, colour, and peace are all here, though the east wind is blowing across Dublin Bay, and a soft grey-blue haze bathes the distant trees and half hides and half reveals the rolling mountain tops beyond. Great bushes and trees of *Phillyræa*, snowy *Mespilis*, *Walnut*, *Arbutus*,

Weeping Ash, Hollies, etc., abound ; but the great feature of the charming old place just now is the long herbaceous border, and the grace, sweetness, and colour, whether in harmony or in contrast, of its many well-grown flowers. Border and wall alike are fronted by a breadth proportionate, of closely mown green sward, and still further away is a dry walk of gravel for the wet days that come so often here betwixt the mountains and the sea. To see a simple and naturally planted border of this kind

amid genial and sheltered surroundings, makes one wonder how it is that the flower and garden pictures in our public exhibitions are so often stilted and artificial looking—or so skimpy and unreal. There are many beautiful garden pictures at Nutley. There are many beautiful and informal gardens made for use—that is, for rest and recreative enjoyment, and also for fruit and vegetables—in Ireland, and of those of this satisfying character the one at Nutley may be cited as a worthy example.—F. W. B.

Howth.—At Howth yesterday to see the Rhododendrons nestling beneath the grey and mossy rocks, and half-shaded by Larch, Birch, and Mountain Ash trees. The Blue Bells are over, but the young brake fern fronds are springing up amongst the Japanese Azaleas and the Rhododendrons, and add their tender greenery to their stained-glass like colours. I wish you could see the old castle and its gardens, with telescope and spectacle views or vistas through the trees. The Hawthorn has been lovely in the surrounding meadows, and some trees are still white as snow. You would like to see the great brown hares “lepping” about all over the surrounding fields, but of course they and the rabbits are wired out of the garden. There is a fine old Stone Pine on the lawn here, and an old enclosed garden, with Beech hedges 20 feet high, with grass walks in between—that reminds one of other days—days of Elizabeth and Shakespeare, or of those of the Puritans and the Cavaliers. Howth Castle itself dates from the 14th century, and its old-fashioned gardens always seem to remind me of what gardens must have been in Parkinson’s time—in summer, full of Roses and Lilies, Iris, and Thyme, Lavender, and Rosemary, and in autumn, with Plums, Peaches, and Figs ripening on the old grey walls. A shelter belt of Sycamores and Elms runs along the shore, but in mounting the path up the meadows that leads to the rocks and Rhododendrons you get an ample glimpse of the eternal sea, and the two islands, Ireland’s Eyot and Lambay, that lie to the right of the entrance to Dublin Bay. One charm of the place is that the garden itself at the house is green and quiet, *restful* and fragrant, without any glaring colour, the Rhododendrons being up on the hillside half-a-

mile away, and there the gorgeous blaze of sun-lit colour is toned and softened by greens and browns and greys innumerable, and overhead the everchanging sky.—F. W. B.

THE COCKSPUR THORN AS A FENCE.—This is excellent as a fence plant, and it also gives us a fine effect of brown-red colour in autumn. Compared with it, Cherry Plum is a poor, short-lived, feeble thing, while this is hardy and free, and will live for generations. Grafted plants, however, are useless, because the stock, being a native plant and more influenced by our season of growth, will certainly come up and in time kill the plant, and one can hardly expect that people should go along a hedge-row and pick off suckers. All the Thorns bear fruit as freely as the common Quick, and, except in the case of great novelties, there can be no difficulty in the way of getting them from seed. Many of the Thorns have been introduced within the past few years into our gardens, but how seldom one sees them ; undoubtedly it is because of the grafting on the common kind, which costs only a trifle per thousand and is, therefore, always at hand. Most of the plantations made by our forefathers in this direction have failed for this reason. The plant we now refer to, *Crataegus crus galli*, is a native of the northern states of America. It grows from Manitoba to the southern district of Florida, and at maturity reaches nearly 30 feet. There are several forms, but the best is the common one, and there ought to be no difficulty in getting this freely as seedling plants either in American or European nurseries. There is no reason why most people should seek a better fence plant than our own Quick ; but sometimes in gardens and pleasure grounds a fence of beautiful colour may be desired.

BROWALLIA SPECIOSA MAJOR.*

THIS, a native of New Grenada, is, so far as is known, the most beautiful of its family. It is of good form, producing for a great part of the year flowers of a pretty violet-blue colour, relieved by a white throat, and in their size and number remarkable compared with the size of the plant bearing them. It has won its way at once, and is particularly useful in late autumn and winter when flowers are few out of doors. It may be grown from seed, or cuttings, which is, perhaps, the better way, as making plants of sturdier habit and earlier to flower. It thrives in a light rich soil with all the light and air that can be given under glass. Stopping to ensure a bushy habit is best, as the shoots are in a hurry to bloom, and run up to a height of $1\frac{1}{2}$ to 2 feet, with a large flower in the axil of each leaf in unbroken succession so long as the plant continues in active growth. Propagated from cuttings of partly ripened wood in early spring, and again in the summer, it is possible to have it in bloom well-nigh the year round, growing in the cold or temperate house according to season. In the south of France, though a little difficult to establish at the outset, it grows well outdoors during the greater part of the year, until checked by the nights of December; but it is best to have cuttings in reserve during the winter, which should not be exposed until April is well advanced. It has been tried as a garden plant in other parts of

France, but with only partial success, as it is very liable to suffer from cold rains.

In flower its profusion is equal to that of *Streptosolen Jamesoni*, for many years called a *Browallia*; in fact the form of flower is almost identical. When well grown these two plants alone will go a long way towards keeping a house bright when days are dull. One frequently hears the *Streptosolen* reproached as a shy bloomer, mainly because, when out of flower in summer, it is temporarily shelved. In the south of France, where its growth is fully ripened during the long rainless summer and sunny autumn, the show of blossom is gorgeous, and lasts from February to the end of April unbroken, until every growth has shown its head of scarlet and orange flowers, borne, not like *B. speciosa* on long erect stems, but in dense hanging clusters. It is no uncommon thing to find not a single shoot without its bud (and so unsuitable for spring cuttings) until the plant is sharply cut back. The English summer is so different in character, that to obtain such a result is not possible, but it may serve to indicate clearly the means of success. Cut back the old wood after flowering, and encourage vigorous new growth in a light and sunny position as can be found, gradually reducing the waterings as the new stems develop and removing anything weakly that hinders free action of light and air. With growths thus well seasoned, it will

* With coloured plate from drawing in Mr. Sanders' Nursery, St. Alban's.



EROWALLIA SPECIOSA MAJOR

not fail to bloom freely as soon as the lengthening days encourage growth, but it is a mistake to force it into flower prematurely by undue heat. Like the *Browallia*, it requires light sandy soil,

and strikes root with perfect ease. A variety *floribunda* is sold, but it is impossible to imagine anything freer than the type when well grown.

J. H. B.

IS DIFFERENTIATION, OR DIFFERENCE IN CONSTITUTION, IN FLOWERS NECESSARY FOR THEIR COMPLETE FERTILITY?

(Continued from page 138.)

The same may be said of the next most extensive order of flowering plants, the *Leguminosæ*. "These," Bentham says, "form, after the *Compositæ*, the most extensive of all the natural orders of flowering plants" ("English Flora," p. 155). In all the flowers of this order the pollen is ripe and shed at a very early stage, when the flowers themselves are but half-grown. When the pollen is shed it falls into the keel and is there, in most cases, stored. This ripening of the pollen takes place in all the flowers before the vexillum is reflected; before that is reflected, no nectar-seeking insects can gain access to, or come in contact with, either the stamens or the pistils. The flowers are, consequently, peculiarly framed for self-fertilization. The pollen and stigmas of such flowers must have a similar constitution, as there is nothing to intervene whilst they are growing to cause their "differentiation." Their productiveness is evidenced by their universal distribution. Mr. Wallace says, "An immense variety of plants are habitually self-fertilized, and their numbers probably exceed those which are habitually cross-fertilized by insects" ("Darwinism," p. 321). Again he says, "It is usually the species which have the smallest and least conspicuous flowers which have spread widely."

If Darwin's idea that the want of differentiation between the stamens and pistils of the same flower led to inferiority in fertilization, then the "great principle"—which he advances when he thinks it supports a theory of his own—"of Nature not lying" ("More Letters of Darwin," vol. ii., 252, 253) would be egregiously violated in the majority of flowering plants. Arrangements would exist

seemingly for the plant's benefit, which in reality, were sham arrangements to be set aside by a superior effect from cross-fertilization.

In order to establish Darwin's theory in respect to the beneficial influence of differentiation it is necessary to show that two sets of flowers of the same species which are equally healthy and vigorous, yet grown under different conditions, by being intercrossed with each other, *mutually* affect each other *beneficially*, so that their offspring is thereby *mutually invigorated*. If such mutual beneficial result does not follow, but only one set is beneficially affected, it merely shows that one set is in a healthier and more vigorous condition than the other. Darwin gives us the result of one such reciprocal crossing from Knight. "By crossing reciprocally the tallest and the shortest peas," Knight says, "I had in this experiment a striking instance of the stimulative effects of crossing the buds; for the smallest variety whose height rarely exceeded 2 feet was increased to 6 feet; whilst the height of the large and luxuriant kind was very little diminished" ("Animals and Plants," vol. ii., 110). The result, consequently, was both beneficial and injurious, not mutually beneficial. The benefit was limited to the weaker case, and was actually, in its measure, prejudicial to the other. Until "mutual invigoration" is proved we may well suppose, from this case cited from Knight, that bees and insects generally may, by effecting cross-fertilization in different flowers, act both beneficially and prejudicially by their visits. The weaker flowers would be improved by their fertilization by the stronger; the stronger injured by being crossed with pollen from the weaker.

Sprengel, at the close of the eighteenth century, was the first to recognise that insects were influential in promoting fertilization by "brushing pollen from the anthers with various hairy parts of their bodies and conveying it to the stigmas." "His theory" about flowers and their fertilization by insects, Müller says, "although the first effort in this wide field, would have afforded a satisfactory key to the chief puzzles of the floral world had it not contained a very serious flaw." This "flaw" was that Sprengel did not recognise the superior effect of cross- over self-fertilization. "This omission," Müller continues, "was for several generations fatal to Sprengel's work, which was otherwise well fitted to give a powerful impetus to further research" ("Fertilization of Flowers," p. 3). This theory Sprengel never put forward nor advocated. Sprengel was happily free from what Darwin's great contemporary, Professor Sedgwick, calls "the dangerous position of those who view all things through the distorting medium of an hypothesis."

It was left to Darwin to supply Sprengel's supposed defect! The method by which Darwin was led to adopt this theory has been described above; a method which seems to have been exactly adapted to produce results, unconsciously to himself, according to his theories. H. Müller, following in his wake, adopted and advocated Darwin's theory throughout his work on "The Fertilization of Flowers." The constantly reiterated plea for cross-fertilization, oftentimes on very insufficient evidence, detracts greatly from the value of his book. The eminent botanist, Axell, held the opinion in contrast to Darwin and Müller, that the self-fertilization of flowers under equal conditions, in a state of Nature, was the natural fertilization, and that "the most perfect flowering plants are those which regularly fertilize themselves" (Müller, "Fertilization of Flowers," p. 587). Meehan in like manner advocated, as we have seen in one or two examples given above, views similar to those of Axell. With him, also, other cultivators strongly felt "that a great deal too much had been claimed for the work of insects in plant cultivation" (*Garden*, vol. x.

493). Every year that passes is bringing additional natural evidence in favour of Sprengel's standpoint. He can, consequently, "well afford to bear a small amount of blame" ("Cross- and Self-Fertilization of Plants," p. 7) for his "flaw"!

In favour of Sprengel's reservation, and against Darwin's theory, stand the numerous cleistogamic flowers. There cannot possibly be any differentiation in the constitution in the stamens and pistils of their individual flowers. In these forms, too, all cross-fertilization is absolutely excluded, and yet they are, as Darwin states, "abundantly productive" ("Form of Flowers," p. 311); "they produce as a general rule as many seeds as the perfect (open) flowers" (*ib.*, p. 338); "they never fail to produce a large number of seeds" (*ib.*, p. 340); they are sometimes more productive than the open flowers on the same plant (*ib.*, pp. 322, 326). These cleistogamic flowers are met with on a multitude of plants, and the number of such plants is constantly being added to; they, in our opinion, refute categorically Darwin's theory about difference of constitution or "differentiation" being necessary for the complete fertility in flowers.

[NOTE.—Some writers speak of the fertilization of diœcious flowers as "cross-fertilization." Cross-fertilization for such cases is a misnomer. In diœcious fertilization there is no substitution of the pollen of a different flower for that of its own flower. It is necessitated by Nature's own arrangements that the stamens of one plant should fertilize the stigma of another. There is no "crossing" from the other side.]

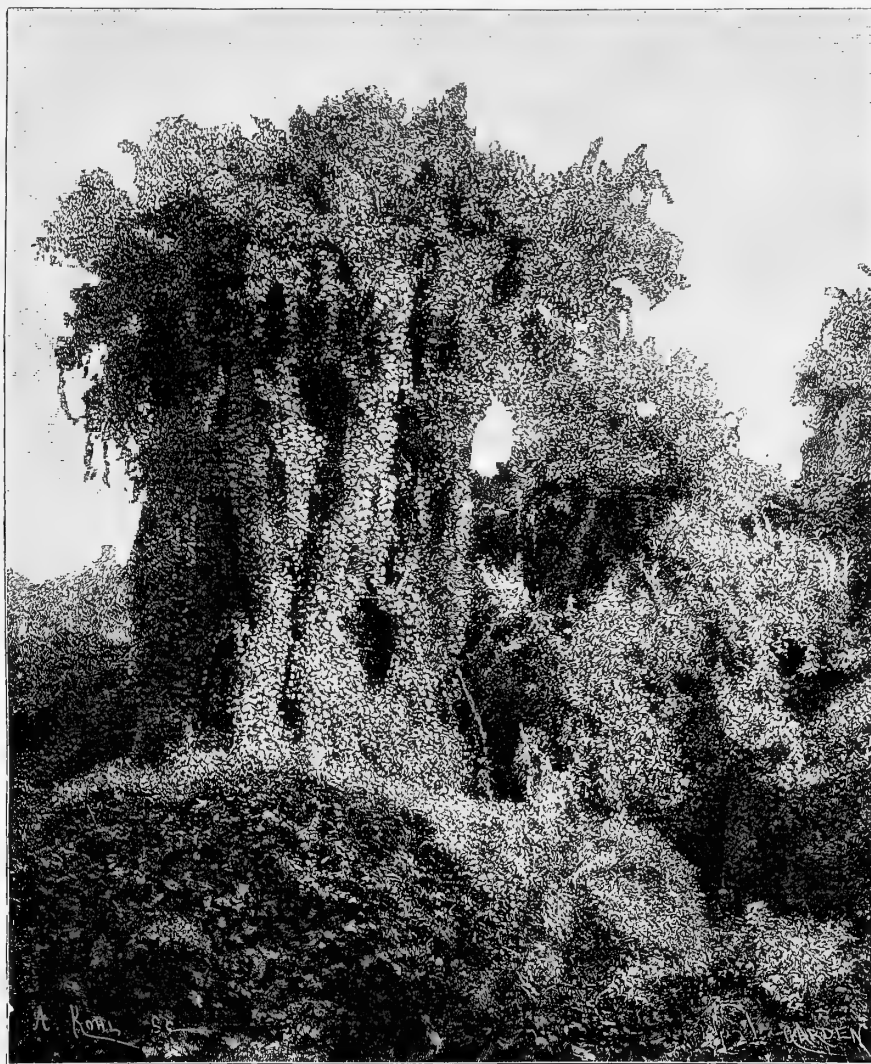
"If the conveyance of pollen," Müller says, "to the stigma by insects is of no greater advantage than the direct contact of the reproductive organs in the flower"—which the natural evidence of the cleistogamic flowers unequivocally supports—"then," in Müller's words, "the preference of the former uncertain method (by insects) to the latter seems unnecessary and capricious, and any theory based thereon falls to the ground" ("Fertilization of Flowers," p. 3).

A FIELD NATURALIST, M.A.

THE VINE FOR ITS FORM.

If it is only in the warm southern valleys that we may hope to fruit the Chasselas or any of the earlier Vines, all may enjoy its fine leaves and habit for covering vacant spaces on walls, since for wreathing up and over trees, festooning pillars, or covering pergolas, few plants can equal the Grape Vine. The form of its leaves from first to last is beautiful, their colours often fine. Who shall describe the soft, woolly tenderness of the young Vine leaf bursting from its nest in the nut-brown bud? During its life it is painted by turns with varied tints of green, and then, when the change comes over it in the autumn how beautiful are the hues either of the European, Japanese, or American Vines. Some Vine leaves put on a russet colour before they die; but others, such as the Barbarossa, the West's St. Peter's, and the purplish-leaved Vines of France, of which there are several (one known among us as the Claret Vine), all show fine colour in autumn. The variety in form and size of leaf is just as marked. From the wide expanse of a White Nice, measuring a foot and a half across, or Thunberg's Vine a size smaller, we come down to the Parsley-leaved and variegated forms of our gardens. No plant is better suited for scrambling over sunny rocks, clothing uncouth tree-stumps or out-buildings than the Vine. Its freedom of growth, the curious beauty and strong grasping power of its tendrils, its grace, its associations, are all points in its favour. Neither is it needful that the Vine should climb like a giant to become a source of interest in gardens. Some of the American wild Vines are more gorgeous in colouring and varied in forms than

our cultivated sorts, showing in autumn every tint from green to gold, orange, and crimson. Another rare charm of the Vine lies in the sweetness of its blossoms, which not even the Violet, Sweet Briar, or Lime can surpass. Though, as a whole, our country is unsuitable to the Grape Vine, there are parts of the Thames Valley and southern counties in which far



WILD GRAPE VINES IN THE SAN JOAQUIN VALLEY

more might be done in this direction, wherever the protection of a warm wall is to be had. Trial of selected early varieties would soon show which gave the best results, we therefore add a descriptive note of the best of these early kinds, particularly those succeeding in the colder parts of France. They have many local names, but we give those best known.

Gamai de Juillet, grown in various forms, but the best of its class ; a vigorous grower, renewing well when cut by late frosts, and even then ripening in advance of any other. Its growths run from 6 to 9 feet, carrying fair-sized bunches of bluish-black grapes, juicy, but slightly acid ; ripens from the end of July, and succeeds as far north as Nancy. There is a local variety, *Précoce de Montreuil*, considered superior, in its own neighbourhood, to the *Gamai*, but the plant needs care and to be well established to fruit well. It fails if closely cut, the lower eyes proving sterile, but old plants bear freely and ripen early. The fruit is sweeter than the first and with a tough skin keeps well. *Précoce de Malingre*, another hardy plant, is much grown in the Vosges and other cold districts. Even when ripe the fruit does not colour but clears. Its skin being tender, it does not travel well, but comes earlier than the *Chasselas* by a fortnight. *Madeleine Angevine*, a good white grape, juicy and sweet, if rather small ; comes early, but like most early grapes is an uncertain cropper : a seedling derived from it, *Madeleine Céline*, promises to do better in this respect. The *Madeleine noire*, the early one of Paris, is better known, ripening at the end of July, or quite early in August, some ten days later than the *Gamai*. This comes well in good weather, but readily spoils if wet ; the berries and bunches are somewhat small but of good flavour. This is followed by the *Madeleine Royale*, much grown in the cold north-east, where others ripen with difficulty. A strong fertile plant, doing best when pruned long, and pinched as the shoots show fruit. It is also somewhat liable to spoil in bad weather, but is a fair setter, bearing good white grapes, finely flavoured, and quite equal to *Chasselas*. *Gros Coulard* is an old variety, of good size and quality, but a very uncertain cropper in the north ; in southern latitudes shows itself one of the best early grapes. *Vert de Madère* is a variety from the north of Italy, coming in a few days earlier than *Madeleine Royale* ; the fruits take little colour even when ripe, and though good are often scanty. The *Lignan Blanc*, another Italian grape, does well as far north as Paris in good seasons, and for its beauty, size and flavour is equal to the best early grapes. Like some other Vines, it will

not bear close cutting, but fruits well when allowed to run. The *Précoce de Courtiller*, also white, has a slight muscat flavour, and beside being very early is of good quality, but the bunches are small, a fault which it shares with *Muscat Durbaye*, the best early muscat. Following these earliest varieties are the early *Chasselas*, *Duc de Malakoff*, *de Florence*, *Duhamel*, and *Vibert*, all of which are good, but varying in reputation in different districts. Though it cannot rank as an early grape, a seedling variety of Japanese origin, raised and cultivated in Normandy, fruits and ripens regularly where no other has been found to succeed. As a robust and hardy grower *L'Alençonnaise* thrives in poor situations, and its fruits (if not of highest quality) are juicy and sweet. A second Vine, of similar origin and every bit as hardy, is *Précoce Caplat*, an improved form of *Vitis Coignetia*, bearing attractive bunches of black fruit, small, juicy, and a little acid in taste. Though not worth a place for its fruit, this is bold in leaf and rampant in growth ; its leaves, sometimes 15 inches and more across, make it a striking object anywhere, and its fruits coming in September or October are an added charm.

WILD VINES.—Our choice of Vines has been increased of late years by plants from China and Japan, some of them very hardy and beautiful. Of these the variegated *Madame Caplat* is one of the best, its leaves showing bold blotches of red and white. This plant is itself a seedling of *V. Romaneti*, the rampant Chinese sort, noticeable for the reddish, hairy, almost spiny, clothing of stems and leaf stalks. *V. Coignetia*, and its form *Précoce Caplat* are both good for their leafy vigour and autumnal colour, while for the latter purpose *V. Thunbergii* and *V. californica* are as showy as any, and rapid in growth. The Virginia Creeper with its popular varieties *muralis* and *purpurea* are so nearly Vines that they may well be classed as such.

The following list gives the species of wild Vines:—*Vitis æstivalis* (Summer Grape), North America ; *amurensis*, China ; *arborea*, United States ; *arizonica* (Canon Grape), North America ; *Berlandieri*, Texas ; *bicolor* (Blue Grape), United States ; *bourquiniana* (Valley Grape), California ; *brevipedunculata*, China ; *californica*, N.W. America ; *candicans*

(Mutang Grape), Texas; *capreolata*, Himalayas; *caribæa*, Florida; *Champini*, Texas; *cinerea* (Sweet Winter Grape) Western America; *Coignetia*, Japan; *cordifolia* (Chicken Grape), United States; *doaniana*, Texas; *erio-clada*, India; *ficifolia*, China and Japan; *flexuosa*, China and Japan; *girdiana*, California; *heterophylla* (Hop-leaved Vine), China and Japan; *himalayana*, India; *inconstans*, in two or three varieties, from China and Japan; *indivisa*, Southern United States; *japonica* (variegated form), Japan; *Labrusca* (Plum Grape), North America; *Longii*, Texas; *munsoniana* (Ever-bearing Vine), Florida; *orientalis*, from the East; *palmata* (Cat Grape) Central United States; *persica*, Persia and Afghanistan; *quinquefolia* (Virginia Creeper), North America; *Romaneti*, North China; *rotundifolia*, United States; *rupestris* (Sugar Grape), United States; *serianæfolia*, China and Japan; *striata*, Brazil and Uruguay; *Thunbergii*, China and Japan; *Treleasei*,

Texas; *vinifera* (Grape Vine)—varieties *v. corinthiaca* (Currant Grape), *laciniosa* (Parsley-leaved Vine), *Davidii*, and many others—China; *vulpina* (Frost Grape), North America.



VINE-SHADED BOWER.

THE HOME NURSERY, as seen on estates of any size, is often a scene of neglect or mismanagement, when planned from the too common point of view of planting "transplanted stuff" instead of the little two-year-old plants that are the hope of the wise planter. In very large wooded estates the home nursery, managed as a forest nursery, may be worth having, for the sake of raising one or two kinds of trees grown to greatest profit in the district, but in far the greater number of places it is far better to buy from a forest nursery the young plants in the best state for planting. Then we have only to see that the little trees are of proper size, and we buy at a price often less than we can raise the trees at home. Among the reasons for this plan is that many soils that grow trees well are not suited for raising them from seed. On the other hand, good forest nurseries are usually on the best possible soils for raising seeds of trees of all kinds; nor should we forget that saving or collecting seeds of Pines and other trees and raising them in the best state for planting is a life's work of itself.

MOUNTAIN FLOWERS. — Together with this great source of pre-eminence in mass of colour, we have to estimate the influence of the finished inlaying and enamel work of the colour-jewelry on every stone; and that of the continual variety in the species of flower; most of the mountain flowers being, besides, separately lovelier than the lowland ones. The Wood Hyacinth and Wild Rose are, indeed, the only supreme flowers that the lowlands can generally show; and the Wild Rose is also a mountaineer, and more fragrant in the hills, while the Wood Hyacinth, or Grape Hyacinth, at its best, cannot match even the dark Bell-Gentian, leaving the light blue Star-Gentian in its uncontested queenliness, and the Alpine Rose and Highland Heather wholly without similitude. The Violet, Lily of the Valley, Crocus, and Wood Anemone are, I suppose, claimable partly by the plains as well as the hills; but the large Orange Lily and Narcissus I have never seen but on hill pastures, and the exquisite Oxalis is pre-eminently a mountaineer.—*Modern Painters*.

HARDY PEA FLOWERS.

THE following notes appeared in *The Garden* some few years ago, but they have been revised, and, in certain cases, somewhat amplified, so as to embody such knowledge as I now possess of plants of the order to which they relate.

There is not, I think, any large family of plants that contributes greater and more diversified beauty to the hardy garden than do the Pea flowers in all their forms. They are found in all colours and in all shades, including sky-blue (with or without *Lathyrus magellanicus*); their habit is extremely varied and the foliage is in the last degree diversified, and in most cases of exceptional beauty, both in form and texture. They comprise also some of the best among wall creepers, and perhaps most of the showiest of flowering shrubs, as well as choice herbaceous and Alpine flowers.

The following notes apply mainly to plants to be found *autour de mon jardin*, although some few are named which I either do not or cannot grow here, and some others that I have seen in other gardens. Everybody knows the Laburnum and False Acacia, while comparatively few know the Judas Tree and the beautiful *Cæsalpinia japonica*, neither of which is perhaps quite hardy in all climates and situations. Again, everybody knows that best of all wall shrubs, *Wistaria sinensis*; but the extraordinarily beautiful Australian creeper *Edwardsia grandiflora* (syn. *sophora*) is very uncommon. If I had the position (in the matter of a wall) and climate to give it, there are few things I would rather grow than this.

Robinia hispida (the Rose Acacia) is among the most beautiful of all flowering shrubs or small trees. It is perfectly hardy, but care should be taken, I am told, not to plant it in an exposed position, as the branches are easily broken if exposed to high winds. An allied tree, *Gleditsia triacanthos* (the Honey Locust), is well worth growing, as are also another very beautiful N. American shrub with pale blue flowers, *Amorpha canescens*, and *Caragana ferox* (the Siberian Pea tree). The former of these is of somewhat doubtful hardiness in cold soils and positions. *Cladastris amurensis* (a shrub which rejoices in more than one alias,

e.g., *Maackia*) is a distinct and beautiful thing, while *Cercidiphyllum japonicum* and *Calophaca wolgarica* are two shrubs of this order which I believe to be very desirable.

THE BROOMS.—Probably there are people in the world (at Kew possibly) who have formed, in their own minds at any rate, some substantial theory as to the difference, botanical or otherwise, between *Cytisus* and *Genista*. I thought at one time that I had arrived at a tenable theory on this point myself, but a study of gardening dictionaries and catalogues has convinced me that I am as ignorant in this matter as when I first began to take an interest in plants. It seems to be generally accepted that the common yellow Broom is a *Cytisus*, i.e., *C. scoparius*, consequently the white variety (*C. albus*), the hybrid lemon-coloured variety (*C. præcox*), and the variety accidentally discovered wild in Normandy (*C. s. Andreanus*) are presumably *Cytisus* also, though the latter is almost invariably sold as *Genista Andreana*. All these are too well-known to need commendation. Anyone with a little room (a commodity of which my garden was for many years deficient) can hardly do better than make a collection of Brooms. Few things are more repaying; for, apart from their extreme beauty as flowering shrubs, they vary greatly, not only in habit but in time of blooming.

The varieties that I have here are *C. virgatus* (the Madeira Broom), a tall plant, some 10 or 12 feet high, that flowers in June. It is an evergreen, and is, perhaps, the finest of the family. *G. æthnensis*, which I suppose myself to possess, looks uncommonly like it. There is also another tall Broom which I have never taken the trouble to get named, but which is probably *C. nigricans*; it blooms in the middle of the summer, in July. Among others of the taller kinds are *C. elegans*, a very early blooming species which produces its soft yellow flowers along with its leaves (this, I am pretty sure, has aliases) and a good Broom that comes late, given to me as *G. tinctoria elatior*, of the dwarf or Alpine species. *C. purpureus* is one of the most beautiful of rock shrubs. There is a variety called *incarnatus*, for which, if I recollect right, they charge a little more, though I

cannot see much (if any) difference between them. I have them both—*i.e.*, if paying means possessing—as also the *white* variety *C. purpureus albus*, a plant of exceptional beauty. I see in the catalogue of a well-known purveyor of these things *C. glabrescens*, said to be a *yellow* facsimile of these, but more yellow Brooms can hardly be an especial need of the garden.

C. Ardoinii is a dwarf shrub of more prostrate habit, which grows very slowly, as does also the rare native *G. pilosa*. This is, perhaps, the best (in the matter of neatness) of the prostrate Brooms; but there are others that, being more vigorous, are possibly more useful. Of these may be mentioned the common Dyer's Greenweed (*G. tinctoria*), its double variety, and also the Alpine variety called *G. tinctoria*, var. *humifusa*, and *G. sagittalis*, a plant abundant in places on the Alps, among others on the Grand Salève, near Geneva, though no one need avail themselves of this information to distress the Society for the Protection of Alpine Plants by digging it up, for they have not a chance of making it grow by this sort of transplantation.

G. anxantica is another very good dwarf species, coming later than some of the others; while *G. anglica* (a small native species, not prostrate), *G. radiata*, and the strong-growing *G. dalmatica* or *hispanica*, are all well worth growing. A plant that I came across the other day in a friend's garden, and which came, I understood, from Messrs. Waterer, who sell it as *C. decumbens*, is exceptionally good and distinct, having a creeping habit and pale lemon-coloured flowers. *G. shipkaensis*, from the Balkans, is, I believe, the only dwarf white prostrate Broom in commerce, if not in cultivation. It is a valuable and beautiful thing, though, in my garden at present, it is neither one or the other, for it has got into a place where it is starved and overcrowded, and when it attempts to grow the snails and slugs punish it unmercifully. Unfortunately these things are quite untransplantable. The Wew hybrid, known as

C. kewensis, which is said to be something of the same sort, is not, I believe, as yet in commerce, and I have never seen it. The value of *Spartium junceum* (the Spanish Broom) is known to everybody, but the pink Broom of New Zealand (*Notospartium Carmichaeliæ*) has certainly not yet achieved any wide popularity. The best specimen—for the matter of that, the only good specimen—I have ever seen of this was in Veitch's nursery at Exeter. I had at one time two plants, one of which has long "gone home," and the other, though not actually dead, can hardly be called "alive," and is never likely to flower again. It is clear, I think, that these are not worth attempting anywhere east, or perhaps north, of the Isle of Wight. At best the plant is, perhaps, more interesting than showy, while the colour of the flowers is of the particular shade which, as I am given to understand, artistic people disapprove. The nomenclature of the Brooms, to most of which Latin names are attached, is hazy, and often, I suspect, very doubtful. There are, however, other sorts beside those already mentioned, which are not only beautiful but distinct. At the moment of writing (June 1) the most beautiful flowering shrub in bloom in my garden is a Broom which reached me through a friend from South Italy. I have not taken the trouble to get it named, but it is evidently quite hardy.

The Coluteas (Bladder Sennas) are good shrubs with yellow flowers, the best of them, perhaps, being *C. bullata*, a dwarfer variety of very compact growth, and very suitable for rockeries. *Cassia marylandica* I have never tried, and probably should lose if I did, for want of wall protection; but the beautiful late-blooming shrub, *Desmodium penduliflorum* (syn. *Lespedeza Sieboldi*), seems to do well. It is said to like peaty soil, but, nevertheless, it thrives in mine, where there is enough lime to kill everything that objects to the latter ingredient. It has purple flowers.

T. C. L.

(To be continued.)

SUN-ROSES IN FLOWER.

PLANTS at Kew are now responding to the warm, bright days by a better display of flower, or free growth, which promises well for another season. The things which seem to revel most in the present heat are the *Cistus* and little *Helianthemums* bordering a sheltered dell near the Palm House. The bold mass of *Cistus* is striking in its profusion of white blossom; but none of the handsome spotted or mauve kinds seem grown to any extent, though a plant or two of *C. recognitus*, with its small crimson spots, lay in the background, and *villosus*, more distinct in leaf than in flower. Very cheery were the little Sun-roses in a somewhat trying glare, and, without exception, the single forms made by far the best display. It is a pity that with their variety of bright colours, and the many sundried stony banks waiting to be clothed, we do not oftener see these little gems. The shrubby species, *H. formosum* and *halimifolium* were as good as ever I have seen them, and only commencing to flower, with plenty of promising buds. The richness of their black-spotted pe-

tals is very telling. The dwarfer kinds showed a variety of tints in foliage, from hoary white and silver, through dark to vivid green, and the flowers ranging from white with golden centre, through rose, salmon-rose, magenta, yellow, copper, orange, dusky orange, and dull scarlet—surely a wide choice. Among the best were *ochroleucum*, a good white; *mutabile*; *Magenta Queen*, very distinct; a variety of *H. vulgare* showing large yellow flowers with orange veinings; and *alyssoides*, with golden flowers, and the edges of the petals just tipped with bronze. A spreading carpet of greyish-green foliage several feet across, named *cupreum*, bore large flowers of a rosy copper-colour, *sanguineum*, being similarly, but more deeply tinted. Two distinct species, less showy in flower, but very neat in form for the rock-garden, were *canum* in dense compressed tufts, with tiny yellow flowers; and *chamæcistus*, a somewhat larger grower with bigger flowers, but the same ideal habit of growth for nestling amongst rocks.

J. H. B.

DIANELLAS.—These are old plants, mainly to be found in botanical gardens, and rare even there, yet distinct and beautiful. There is always a charm in good blue flowers. Blue berries are perhaps rarer than blue-flowers, and it is in their clusters of beautiful blue berries that Dianellas prove so attractive. Not that this is their sole charm, for nearly all are handsome as fine-leaved plants and graceful in flower. Several kinds have been introduced from New Zealand, Southern Australia, and Tasmania. They may be planted in a sheltered border in any of our warmer districts, provided the soil be light and some cover given in severe weather. In colder parts they must be wintered under glass, but are worth their place anywhere as foliage plants. Some of the kinds, *D. longifolia* in particular, resemble a miniature "New Zealand Flax;" *D. tasmanica* is the most beautiful of all, and in its variegated form, well grown, it reaches 5 feet or so in height, and when loaded with blue berries, half to three-

quarters of an inch long, and remaining in a good state for weeks together, it forms a fine object. The other varieties, of which we may mention *D. atrata*, *cærulea*, *intermedia*, *lævis*, &c., are less imposing, but similar in general character, bearing small flowers shading from blue to white, grassy foliage varying in length and texture, and berries trembling from hair-like stems. Like most things Australian they delight in sunshine, and, if the soil to hand be unsuitable, should be planted in a mixture of sandy loam, with a little peat. Once established they grow fast, spreading from the root into bold clumps, and are easily divided when necessary. They may be raised from seed, sown in spring in gentle heat; but it is difficult to get seed. As a last word I would say, keep a lookout for the Dianella—*lævis*, *longifolia*, or *tasmanica* in particular—give it a trial under glass, and I am confident the results will be sufficient reward.

R. I. V.

COTONEASTER (ROCKSPRAY).

LONG outside the waves of fashion and at present taking a too modest place in gardens, these shrubs deserve much more attention. One good kind has trailed for many years over cottage walls, but some of the dwarfer sorts so good for the rock garden are seldom well used, and the large species, so brilliant in fruit in the autumn, are not much planted and are rarely grouped effectively. One beautiful kind of recent introduction is the most brilliant of all rock shrubs when once fairly established, and throws its frond-like branches away from the rocks. Some of those recently introduced from China by Mons. Maurice de Vilmorin are also likely to be valuable bushes for our rock gardens. Being high mountain plants, they have the merit of hardiness and are of the easiest cultivation and increase in various soils. In districts where, owing to drought or other causes, there may be a difficulty in growing alpine plants of the ordinary kinds, these would come in very well to clothe rocks. The best account of the family has been written by Herr H. Zabel, of Gotha, with whose permission we translate and reproduce the following: Allied to the stone-fruited Pomacea, the Rockspray are low-lying shrubs, seldom attaining to the dignity of a tree, with blossoms white or rose-colour, borne singly or in umbels and formed of five petals with anthers seldom more or less than twenty in number. The berry-like fruit is usually bright red or black. The race is found all over Europe, North Africa and Asia

(where the climate is not too hot) with the exception of the far East. The greatest number, as also the dwarfest kinds, are found in the Himalayas; one kind, as yet undescribed, has Mexico for its habitat. More especially deserving the notice of planters is the red-fruited dwarf Rockspray, this being among the handsomest of shrubs for the garden in winter; but the black-fruited kinds are also handsome in leaf and well deserving of attention. In a few instances only are the flowers showy.

C. vulgaris (Lindley); *integerrima* of many authors.—A red-fruited kind, with white and red-stained, or rose-coloured blossoms with erected petals. This is generally an erect, woody shrub some 4 feet high; on the young plants the shoots are yellow and covered with a grey down, but later on they turn to a red-brown colour and become almost smooth. In summer the leaves are green and the leaf-stalks short. In the young leaf the upper side is smooth and dark green, the under sides being more or less covered with greyish hairs, the edges knotted; the tip ends in a spine. The blossoms are borne on short, drooping, side twigs in umbels of two to four or, more seldom, singly. They appear about the end of April or beginning of May, are small in size and pale red. The fruit, which mostly droops, is round, and in colour varies from scarlet to purple-red, each berry containing not more than three stones. It is found almost all over Europe, the East, and in Western Asia as far as Siberia. The following are varieties:—*Depressa* is a rather thorny kind, with lance-shaped leaves, and golden-coloured fruit containing four stones; it is found on the cliffs at Warben, in Sweden. *Leucocarpa*, with white fruit; *Podolia*. *Borealis*, with leaves rather larger than in the type and not so thickly haired. *Intermedia*, single flowered, with leaves covered with soft down on the under sides. The Soongaria Mountains and the Caucasus. (By some

authors known as *vulgaris* or *uniflora*.) *Minutifolia*, small, broad, ovate leaves, covered on the under sides and edges with grey-coloured down; flowers, singly or very seldom two. I discovered it near Heiligenstadt (Elisabeth-hohe), and in nearly identical form but with somewhat smaller leaf on the Hühnerspiel in Tyrol. *Oxyphylla*, a compact, erect shrub, the undersides of the leaves thickly covered with grey down; tip of leaf furnished with a spine; in shape ovate; not unlike *C. racemiflora*, but with larger fruit of purple red. The Swiss Alps (Bagne Thal).

C. uniflora (Bunge) (Single-blossomed Rock-spray).—A shrub 20 to 27½ inches high; in the Alpine regions it takes a prostrate form. The branches, green at first and covered with down, turn to russet and later on appear scaly. Leaves green, oval in shape, but also ovate and with short tips; the undersides sea-green and either smooth at first or becoming so. Flower single, stalk scarcely as long as the calix and smooth. Fruit round, bright red, containing three stones. Native of the Altai and Soongarian Alps.

C. disticha (Lange).—An erect, almost evergreen shrub; the bi-lateral branches covered with stiff hairs; the leaves small, leathery, and round oval; the end stiff, ending in a strong spine. The leaf-stalk short; the upper side of leaf bright green covered with close, stiff hairs, the underside a much lighter shade of green with hairs on the midrib, edges, and stalk. The single nodding, sometimes horizontal, blossoms appear at end of June borne on short side twigs; are of fair size and a handsome red in colour. The scarlet, oval-shaped berries appear in October. Its wealth of flowers and fruit and handsome foliage make it a welcome little shrub, and it is about as hardy for our winters as the well-known *C. buxifolia*. Himalayas.

C. horizontalis (Decaisne).—A much ramified shrub with horizontally spreading main branches, which are at first yellow, then brown, and covered with stiff depressed hairs. The sub-evergreen leaves are small with short stalks, round oval in shape, and the tips spined; the upper side is a vivid green and smooth, the undersidelight green with bristles on the midrib and edges. The leaves fall late, after taking first a red, then rose colour. The blossoms are

numerous and pretty, appearing in the second fortnight of June, generally in twos, seldom singly, and are borne on short from two to six leaved side twigs. They are small with erect petals and rose colour. The fruit is round or conical, bright vermilion in colour, and small, having mostly three stones. A fairly hardy shrub, even in Germany, but in southern Britain quite hardy, and very desirable for the rock-garden, being brilliant in fruit and of fine plumed habit.

C. Simonsii (Hort).—An erect woody shrub of medium height, with long slender branches and bi-lateral shoots covered with stiff hair. The leaves are sub-evergreen, with short stalks, the uppersides smooth, the under sides covered with down, the midrib and edges somewhat stouter in texture than the rest of the leaf, and hairy. The blossoms appear at the beginning of July, borne singly, or, at most in umbels of twos or fives, on short leaf twigs; they are white with red stains. The fruit is bright vermilion, round or oval in shape, and contains three or four stones. This shrub is one of the handsomest of the race in berry, and is fairly hardy in our winter. The seed first came to me from the St. Petersburg Botanical Garden under the name of *C. acuminata*, which, however, it in no way resembles in essentials. Its origin is unknown; probably of the Himalayan region.

C. acuminata (Lindley).—An erect shrub about 6½ feet high, with strong shoots and erect branches, which are bright green at first, and thickly covered with almost rough hairs. The leaves are not glossy, are dark green above, bright green beneath, and end in a sharp spine; they are oval in shape, and on both sides are scattered over with stiff depressed hairs. The blossoms appear in the first half of June, in umbels of two to five (seldom singly), borne on short leafy stalks; they are of fair size, and white with red stains. The fruit is a dark scarlet red, long and flattened at both ends, containing at most two stones. The shrub belongs to the Himalayan region, and in central Germany is only injured in the severest winters, and afterwards recovers in strength.

C. parnassica (Boissier).—Small and low, symmetrically formed shrub with small leaves, smooth on the upper sides, downy beneath.

The blossoms with erect petals are borne on short downy stems in umbels of one to four. The petals, ovate in form, are scarcely longer than the calyx, and shorter than the anthers. The berries are erect, red, and rather downy. A native of the Parnassus, the Balkans, Syria, and (according to Decaisne) Sicily also.

C. tomentosa (Lindley).—Either a dwarf shrub or rarely a little over 6 feet. Rather wiry in habit; the shoots covered with bright grey or yellowish-grey down at first. Leaves dark green above, not glossy, and almost smooth; the under sides and edges covered with whitish grey hairs. The leaf is oval, broad in shape, slightly pointed at end, and the tip furnished with a spine. During June the bright rose-coloured flowers appear, from three to fifteen in number, in a single umbel or cluster of umbels at the ends of the side and top branches. The berries are scarlet. A very handsome and hardy shrub, belonging to the hills of central and southern Europe, and extending as far as the Caucasus.

C. nigra (Wahlberg) (Black Rockspray).—A wiry shrub, a little over 3 feet at its highest, the early shoots covered with thick grey down, afterwards almost smooth. The leaves light green at first, the upper sides more or less hairy; later on they take a darker shade of green and become smooth on the upper side, remaining covered beneath with a fine grey down, and the edges fringed. The leaves are generally oval-shaped, but sometimes roundly ovate; generally ending in a spine, but sometimes rounded off at both ends, and sometimes with a suggestion of heart-shape at the base. The pale red blossoms appear from the middle of May, in number from three to eight, borne on long stalks, generally in two-leaved, less frequently one or three-leaved, hairy, loose, pendulous, single or double (in cold climates short stalked), two to five blossomed, almost erect and compact umbels. The petals are very short and rounded, and about half as long again as the calix tip. The berries round and black. Northern Europe and Central Asia. There are three forms in cultivation:—*typica*, two to eight blossoms; bloom-time lasts as long as, or shorter than, the leaves: *pauciflora* bears one flower or none at all; found in Soongaria and Russian Lapland: *laxiflora*, heads of forty blos-

soms, lasting longer than the leaves; a plant of the warmer zones of the region above mentioned, and exhibits much variety of form according to conditions: (α) a growth and leaf as in *nigra typica*; (β) one known as *C. multiflora*, brought from Moscow, with small, longish, obtuse-shaped leaf, tipped with a deciduous spine; (γ) an erect, slender shrub, growing nearly 3½ feet, known as *C. nummularia*, or *multiflora*, obtained from seed brought from the St. Petersburg Botanic Garden. Leaves of leaf-shoots ovate with terminal spine. Earlier observers attributed the shrub to *C. acutifolia*, but later opinion assigns it to *nigra*.

C. acutifolia (Lindley).—An upright thick bushy shrub of medium height, the young shoots thickly and, later on, thinly haired. The upper sides of the leaves are dark green, rather glossy and smooth, the under sides a light yellowish-green, with hair depressed and scattered, the edges thickly fringed. On the leaf-shoots the leaf is elliptical and slightly round at the base, pointed at the end and furnished with a spine; on the flower branches the leaves are much smaller, longish, slightly elliptic at base, pointed at the ends, the under sides only slightly haired on the flat surface, the veins thickly or thinly covered with brownish down. The blossoms, which appear in the second half of May and beginning of June, are a pale flesh-colour and are borne, in number from two to six, on slender stalks in umbels obliquely erected on the leading shoots or nodding on the side branches. The calix is triangular at the tips, with red points, the edges thickly fringed with wool. The petals are rounded, more or less wedge-shaped from the base upward and about half as long again as the calix. The berry is spherical, black, about a third larger than that of *C. nigra*, and has three to four stones. Native of Dahuria and Mongolia and the confines of China. Varieties are—*typica*, upper side of leaf smooth; *pekinensis*, with dull green leaves, the upper sides sprinkled with hairs; the leaves on the leaf-shoots mostly ovate with somewhat rounded tips; the calix hairy; fruit longish. This variety is known to me only from a single specimen. The berry of this had only two stones, was flat on the under side, slightly rounded on the upper side, and rounded off at the base,

peculiarities which, if established, should mark the plant as a distinct species.

C. Lindleyi (Steudel) (Lindley's Rockspray).—Unknown to me outside the herbarium. According to Loudon, who calls it *C. nummularia*, the flowers are white and borne in a few symmetrical umbels; the berries numerous and black. It is a graceful, low, sub-evergreen tree; native of the mountain regions of Nepaul, where it grows to a height of 10 to 15 feet. In drawings the flowers are single, with erect petals. Hooker, who calls it *C. nummularia*, describes it as a rough or low-lying bush with woody, straggling branches, the leaf circular or ovate, rounded off or short-tipped, with white silky hairs thickly covering the under side; the blossoms numbering two to five in short compact flower heads; the berries small, erect, oval or round, and black. Native of western Thibet and Kashmir at altitudes of 5,000 to 11,000 feet. A sub-evergreen plant smaller than *C. vulgaris*. Some cultivated specimens show rounded leaves nearly an inch in diameter with under sides nearly smooth.

C. racemiflora (K. Koch).—A low wiry or slender erect shrub with round head shoots, in the young plant covered with white hairs, which, later on become russet colour. Leaves green in summer with shortish stalks, the upper sides dark green, smooth or nearly so, the under sides always covered with white grey down. Leaves of leaf-shoots round-elliptic, round-rhombic, or inverted ovate, both ends terminating in slender spines. Blossoms appear at end of May and beginning of June, in number three to twelve, borne on the long last year's twigs in small, leafy, compact, down-covered clusters, which are shorter than their leaves; the ordinary stalk is wanting or very short. Petals white, about as long again as the calix; in form round or round-elliptic, fruit red, round or slightly oval with two stones. Four varieties of this plant are spread through Algeria, Sicily, the East Caucasus, Persia, the Himalayas and Turkestan. Its varieties are:—(a) *Desfontainesi*, a shrub nearly $3\frac{1}{2}$ feet high, with leaves of leaf branches a little over $1\frac{1}{2}$ inches long as a rule, and rather less or rather more than 1 inch broad, sometimes, but rarely, as much as $1\frac{3}{4}$ inches long by rather under $\frac{1}{2}$ inch broad; in shape, broad lozenge shape,

pointed both ends; the leaves of flower twigs smaller and generally wedge-shaped at base, rounded off at tip. Fruit a bright red, one stone. Is frequently seen, with variations, in the Caucasus and in Soongaria. Amongst all our hardy Rocksprays this is the handsomest; the brilliant red fruit continues long on the tree and frequently adorns the last year's branches. (b) *Meyeri*, a small tree about $6\frac{1}{2}$ feet high with slender erect branches. Leaves of leaf branches rounded lozenge shape or round ovate with short sharp tips; generally somewhat tapering to the leaf stalk; in length 1 inch, or a little over, and rather less or rather more than 1 inch broad, rarely as much as $1\frac{1}{2}$ inches long by $1\frac{1}{5}$ inches broad; the leaves of the flower twigs smaller and generally narrow, or broad oval in shape. Flowers in number four to eight in trusses. Ends of calix slightly haired. The berries are smaller than in the variety last described, rounded, dark red at maturity, and for the most part containing not more than two stones. (c) *Orbicularis*, low growing and wiry, with drooped, or sloped almost horizontal carriage of the main branches. The leaves of leaf-shoots are round or rounded lozenge shape, generally short tipped and rather more than $\frac{1}{2}$ or $\frac{3}{4}$ inch long by $\frac{1}{4}$ to $\frac{1}{2}$ inch broad. The leaves of the flower branches are ovate, often blunted or rounded off, or cordiform. Flower trusses of three to six blossoms thickly covered with down. Berries small ovate, bright red, covered with isolated hairs. Received from Metz, under name of *C. nevadensis*. Presumably a native of the warmer zones, since it perishes or is cut down by our winters. (d) *Soongarica* (Regel), a form unknown to me, and, perhaps, not in cultivation; Mountains of Soongaria. According to Regel, it differs from the other varieties of *C. racemiflora* in its scattered downy coating and large ovate leaf. He gives it a place between *racemiflora* and the species next described. The first three varieties I have found easy to raise from seed.

C. multiflora (Bunge).—A stately shrub a little over $6\frac{1}{2}$ feet high; the young branches are thinly covered with a light yellowish-grey down, which quickly turns a light russet colour; the twigs droop. The leaves are dark green and smooth above, the under sides pale green, at first thinly edged with hairs, but later

quite smooth; in shape they are broad oval ending in a spine. The leaves of the flower branches are narrower (sometimes broader), tending to a roundish oval. The blossoms, appearing in May, are white, thinly haired on the undersides and somewhat loosely borne in clusters of ten to twenty. The berries are red in colour and oval in shape. A native of Spain and the Trans-Caucasus extending as far as the Western Himalayas, Altai and China. Among the kinds hardiest in our winters it is the handsomest in blossom. The white flat tufts often cover the branches; the berries, however, are few and ineffective. The cultivated varieties, known to me as *C. reflexa*, are—*Jacquemonti*, with ovate rounded or inverted cordiform leaf; the upper side smooth and dark, the under side covered with whitish-grey down. Native of Kashmir and Kumaon, according to Hooker, who states that “the leaves of the Garwhal plant are generally oval-shaped and pointed, whereas in the Altai and Soongaria species the leaves are rounded, oval, or cordiform.” *Pubescentis*, with underside of leaf covered with soft hairs or down.

C. arborescens (Zabel).—A tree-like shrub a little over 10 feet high; attaining (in warm regions) the size of a small tree; the young shoots are thickly covered with white down but later on are smooth and red or dark brown in colour. The leaves are half-evergreen, smooth dark green above and light blue-green beneath, at first thinly haired and, later on, smooth except on the veins and edges. Leaves circular or oval, round ovate, slightly narrowing towards the stalk, rounded at the upper end and terminating in a very short or curtailed spine. On the leaf-twigs they are nearly or quite 2 inches long by a little over 1 inch wide and are borne on strong stalks; on the main branches they are larger; those on the flower-twigs are less than 1 inch long, in shape varying from broad-elliptical to round wedge-shape and frequently emarginate. The blossoms are white, and very numerous about the middle of June on the last year's branches; they are borne on short-stalked compact whorls of five to ten. Close to the stalk the broad inverted cone-shaped calix and its triangular tip are alike thickly covered with down. The petals are round-elliptical in shape. The berries are

black dusted with blue and conical. The shrub is a native of the Himalayas or Kashmir. I saw it so long ago as 1859 in flower in the Greifswalder Botanical Garden. With us it never attains to tree stature, being cut down by severe winters, from which, however, it recovers and forms a tall elegant shrub, handsome in leaf.

C. bacillaris (Wallich).—A tall shrub or small tree; the young shoots at first thinly haired, become quite smooth and a brown or russet colour. The leaf is narrow elliptical in shape, about 3 inches long by about 1 or $1\frac{1}{4}$ inches broad, equi-pointed at both ends, terminating in a spine; at first haired on the edges and the under midrib, but soon becomes quite smooth. The leaf is dark green above, pale green below. The leaves of the side twigs are somewhat shorter and broader. The blooms at the end of the short side twigs are borne on long-stalked, rather close-set clusters of many blossoms. The calix at base and tip is sparsely haired. The petal is white and thickly bearded at the base. The berry is conical and dark brown in colour. The variety *obtusata* differs from the type in having shorter leaves, and flowers and flower-stalks almost hairless. In the variety *floribunda*, raised by me from seed received from Kew, the leaves are smaller by one-fourth and the hair under the leaf longer. In the variety *parvifolia* the leaves are elliptical, pointed or blunted at the ends and vary in length from $\frac{1}{3}$ to 1 inch. The flower heads are short and blossoms small, numerous and compact. Bhotan. A native of the Himalayan region. Closely resembles *C. frigida*.

C. affinis (Lindley).—A small tree, differing from the last in being more closely haired and broader leaved. The young main shoots are at first thickly covered with depressed hairs, but these become thinner, though the stem is never quite smooth. The leaf, stalk, and the underside of leaf, at first hairy, become smooth later on, except on the midrib and at the edges. The leaves are broad elliptical in shape, short-pointed at both ends, or rounded off at base and (more seldom) broad oval and rounded at the ends. The flower stalks are more or less covered with wool or down; the common flower stalk borne loosely and covered with down. According to Hooker,

C. affinis differs from *bacillaris* only in the under side of leaf being downy, and the more regular form of the flower heads in *bacillaris*, but there are many intermediate forms. Without the dark-coloured berries it is difficult also to distinguish *C. affinis* from *C. frigida*. Native of the Himalayas.

C. frigida (Wallich) (Alpine Rockspray).—A tall tree-like shrub, or small tree. The young main shoots are at first covered with a yellowish or brown-grey down, which becomes thinner later on. The leaf-stems droop and are thickly haired. The leaves of main branches are sub-evergreen, narrow and long, wedge-shaped at base, short-pointed or rounded off, the ends terminating in a spine; the upper sides dark green and smooth, the lower sides remaining covered with brown or reddish hairs, thickest on the veins and at the edges. Leaves 2 to 3 inches long, or thereabouts, by 1 to 1½ inches broad. Blossoms snow-white and in numerous panicles, borne on long hairy stalks. Berries scarlet, conical, and continuous through the greater part of the winter. Himalayas. In England one of the handsomest of autumn-berried shrubs for the garden. These three Himalayan species, lastly described, attain in their native habitats and in warm climates the size of small trees, but in colder regions are cut down, and though recovering do not bloom; at least, I have never seen any, and have, therefore, quoted the descriptions. Unfortunately, also, these two or three species are much confused, and their descriptions by various authors so contradictory, that without the aid of leaves, blossoms, and berries all from the same plant it is impossible to distinguish them with certainty. This mostly applies to *C. affinis*, which now resembles a variety of *frigida* with red berries, now a variety of *bacillaris* with dark brown fruit, and is again itself with violet-brown berries, only to appear again with red or dark red berries. Possibly under the name of *affinis* plants of various derivations have been described, sometimes broad-leaved forms of *frigida*, sometimes more hairy forms of *bacillaris*; hybrid growths also are not impossible. In general I have followed the lead of Hooker.

C. lanata (Decaisne) (Woolly Rockspray).—A low, thickly ramified and small-leaved

shrub, with spreading twigs covered at first with whitish-grey down, later becoming dark brown and smooth. The leaves are sub-evergreen with very short stalks, are light green above covered with thick down beneath, whitish-grey on the young leaf but tinged with yellow in autumn, the edges at first closely fringed. In shape the leaves are long or broad elliptic, both ends equally pointed. A little more than half-an-inch in length the leaves are tipped with a short spine and narrowed towards the stalk; on the flower-stalks the leaves are a little smaller. Blossoms appear from the end of June to the end of July, in umbels of four to six. The calix is conical, and next to the outer side of the tip covered close with long hairs. The fruit (according to Decaisne) is red and about the size of a peppercorn. According to the same authority the shrub is a native of the Nilgherries, but this is uncertain. It is an interesting form distinct in the shape and hair of the calix tip, which suggests the *buxifolia* group; but, unfortunately, it is not hardy in our climate. A specimen planted perished in its first winter. *C. lanata* of many gardens belongs to *C. buxifolia*.

C. rotundifolia (Wallich) (Round-leaved Rockspray).—This as a living plant is unknown to me; but, from descriptions, is an upright wiry shrub rising from a little over a quarter of a yard to a little more than half a yard high. The branches are at first thickly covered with yellowish-grey hair, but later become smooth, glossy, and red-brown in colour. According to Loudon, it is a bush 3 to 4 feet high, with low-lying branches. The leaves are leathery in texture, evergreen and short in the stalk; according to Dippel almost circular in shape, or broad oval or oval, and broad-elliptical, rounded at both ends, or narrowing off; in length half-an-inch or little less, and almost the same in breadth, both surfaces sparsely haired, the upper side deep green, and the lower light green in colour. According to Koch the leaves are close set, round or ovate in form, somewhat narrowing at the base, and hairy on both surfaces. The white blossoms appear at the end of May or beginning of June, according to Dippel, in number from one to three; according to Loudon singly; in size a little more than 1 inch across; in colour white and

(sometimes) pink beneath. The calix and the broad ovate calix tip is, according to Koch, devoid of hair, according to Dippel it is smooth or almost so. The berry is conical or ovate, and contains two stones. Himalayas.

Plants corresponding with the above descriptions I have never seen, and what plants I have obtained from various sources, as *rotundifolia*, have always presented the characteristics of *buxifolia*. A longer leaved form which was sent to me from a Dutch nursery as *buxifolia*, but which probably belonged to this species, perished in the first winter without having bloomed. This was an erect bushy shrub, about 18 inches high, with slender and (later on) almost smooth brown branches, the leaves ovate in shape, about an inch long, and a little less or a little over half-an-inch in breadth, with short stalks, the upper extremity rounded off or emarginate like the leaves of the Box tree; but slightly fringed at the edges, the under sides always hairy, sometimes on the face or the slightly reflexed edge of the broad wedge-shaped base.

C. buxifolia (Wallich) (Box-leaved Rock-spray).—A low, spreading, woody shrub, with red-brown branches, at first thickly or thinly covered with stiff hairs, but later becoming smooth or nearly so. The leaves are evergreen, leathery in texture, short-stalked, broad or round oval, rounded at both ends or blunt, pointed and tipped with short spines; the edges and fringed upper sides dark green, rather glossy and slightly hairy, the under sides light yellow or brown-grey, and more or less covered with thick depressed hairs; in size about half-an-inch or less, on the leaf twigs, by a third broad; on the flower twigs generally smaller, broad wedge-shaped, blunt at the ends and emarginate. From the end of May the blossoms appear, borne on short, leafy, shaggy twigs, in heads of one to three, white with red stains behind. The calix is broad, conical, thinly haired near its top, which is broad oval, or triangular and slightly pointed and fringed. The flower petals are about twice as long as the calix tip. The fruit is a bright red, round conical, with two stones. This shrub is of the Himalayan region, a handsome plant for the rock garden, and only cut down by the hardest winters. Varieties are—*typica*, with two to

three blooms (seldom one only), borne on twigs; *uniflora*, flower twig with one terminal blossom; *lanata*, with undersides of leaves closely haired.

C. microphylla (Wallich) (Common Rock-spray).—A dwarf spreading shrub, with red-brown shoots, at first thickly covered with white hairs, but later taking a darker colour, becoming smooth or nearly smooth. Leaves evergreen, leathery in texture, and with short stalks, the upper sides glossy, dark green and smooth, or nearly smooth, the under sides covered with whitish or yellow-grey depressed hair; with edges rolled and at first fringed. The leaves on the leaf-branches are long wedge-shaped or narrow ovate, generally with short pointed ends, sometimes rounded and tapering towards the stalk. The leaves are less than $\frac{1}{2}$ inch long and less than $\frac{1}{4}$ inch broad, on the flower-twigs they are even less. The blossoms appear at the end of May and continue till the middle of June, and are borne on short, close-set, leafy side-twigs, mostly in ones, seldom in twos, and are about one-third of an inch across. The calix is inverted-conical in shape, and, close to the triangular tip, rather thickly haired. The calix tip is one-third shorter than the white flower petals. The fruit is bright red, round, mostly with one stone. Himalayas. In cultivation it displays the same qualities as *C. buxifolia*. Var. *glacialis* (*C. congesta* of some authors), with leaves smooth and blue-green underneath, and small, often bright rose-coloured flowers.

C. thymifolia (Hort.) (Thyme Rock-spray).—A handsome, rather erect-growing shrub, with outstanding branches, and the smallest leaf of the family. The shoots, at first covered with soft hairs, soon become smooth and red-brown in colour. The leaves on the leaf-shoots are about one-twelfth of an inch long with long stalks, linear wedge-shape, narrowing sometimes at the points and always towards the leaf-stalk; elsewhere the leaves are rounded or shortened off and emarginate, not pointed, with disappearing spines; in length about one-third of an inch long by about one-twelfth of an inch broad, the upper surface glossy, dark green, and only at first set with single hairs; the under sides bright, grey-green with thinly scattered depressed hairs; the edges rolled and

sparsely fringed. The flowers are smaller than those of *microphylla*. The berries are small, red, and round. Himalaya from Kashmir to Sikkim. Not hardy in cold districts.

The following are imperfectly known to me :—

C. compta (Lemaire).—Cultivated in gardens ; a distinct and free-flowering species with black fruit. A second evergreen species from Mexico. A third kind, with smooth glossy leaves, wand-like, dark purple twigs with whitish, warty excrescences, shaggy tips and short, shaggy, fluted leaf-stalk ; leaf almost elliptic and spined at the tip, nearly 2 inches long, shagged underneath on the midrib and at the edges. The flowerheads are compact, well furnished and leaved at the base. The calix, which is shaped like a top, is fine-toothed and shaggy ; petals rounded and hairy at the base. This group belongs to no systemised order.

C. pannsosa (Franchet).—Described in the Hand-List as cultivated at the Royal Gardens, Kew, and a native of Yunnan ; cultivated also at the Darmstadt Botanic Garden.

To complete Herr Zabel's study of the Cotoneaster we append brief notes of four new species recently introduced, and still so rare as not to have come under the author's notice. They are to be found in the collection of M. Maurice de Vilmorin, and are as follows :—

C. Francheti (Bois).—Raised from seed received from Thibet ; an erect-growing shrub, 4 to 5 feet in height, stems at first covered with white hairs, then brown. Leaves long, persistent, with reddish stipules, nearly $1\frac{1}{2}$ inches in length and $\frac{3}{4}$ inch at the greatest breadth ; nearly glabrous above, velvety beneath, with salient veinings. It flowers in June, blossoms white, marked with red on the outside of the petals ; the berries, light orange in colour, appear in September, and last during a great part of the winter. A fine shrub, handsome in leaf and berry, and likely to be very useful.

C. adpressa (Bois).—A new species, a full description of which is not yet published. It forms a low densely spreading shrub, well suited to a place in rock-gardens.

C. bullata (Bois).—A shrub reaching 3 to 4 feet in height, with a somewhat drooping habit, bearing berries of a dark blood-red colour.

C. angustifolia (Franchet).—A very valuable species received from Yunnan. Has so far reached 2 to 3 feet in height, with spreading spiny stems, loaded with brilliant red berries, persistent throughout the winter. Provided this plant proves hardy in our winters, it will be of great value in gardens. Plants of some of these new species are in cultivation at Kew.

THE NEWER CLEMATIS, AND OF THE LOSS OF CLEMATIS IN GARDENS.

THE issue of a coloured illustration of one of the more beautiful of the newer Clematis, with a list of the newer varieties, is a good opportunity of saying something as to the slight use made in gardens of these beautiful plants, owing mainly to death or disease among them. After the Rose no flower is so precious for gardens and houses as the Clematis, with its elegant forms, fine colours, and its habit—more graceful, perhaps, than that of any other climbing plant. But while hundreds of fine varieties have been sent out, both in England and

France, it is unusual to see a garden in which any good effect results, even if the plants have not died. The loss to gardens is great, and to the house also, for among the most beautiful wreaths for the adornment of houses there is nothing so good as the long shoots of *C. viticella*, or any other free-growing kind. When we grow the wild kinds of Clematis raised from seed in the great nurseries, we do not find this trouble arise, the plants being among the most vigorous and easy to grow. I have sown *C. viticella* in a hedgerow, and have it



now in a lovely wreath of flowers and tendrils above the dog rose hedge and the thorn. The most showy Clematises of the past generation or two have been of Japanese or Chinese origin, and different in size, form, and character from the European kinds we know. The desire to increase these finer varieties is so strong that any easy means of doing so rapidly is seized upon, and to that is owing the death of the plants. They are grafted on stocks entirely different from their own, and the good old-fashioned way of layering is abolished in favour of the easier way of grafting on a common stock. In the nursery the object is to get the plant into a saleable size as early as possible, whereas that of the private grower should be to get a plant that will live and get better as it grows older. Whatever the cause, we have to face the serious loss of a plant which in good health might adorn the garden more than any other climber for the better part of the summer and late autumn. In my own planting I have taken much trouble to find a nurseryman who layers his Clematis and I have not lost any so grown. There may be other conditions against us, such as heavy soils, which do not suit the plant so well as lighter or calcareous ones, but even in adverse conditions my layered plants do not die, nor the seedlings. The more careful nurserymen graft on *C. viticella* (on little bits of the roots) and they say the plants quickly free themselves, and root in this way; but it is a delicate process

to trust compared with the seedling or layer. All who value their Clematis should do what they can to solve the question, and if we graft new kinds on the wild kinds nearest akin to them in nature, success will be more certain. The newer forms of *C. viticella* raised by M. Morel, of Lyons, will do very well on the wild plant of the same name, but it would be better still in the case of good kinds to have them layered, a matter of no difficulty. As we cannot persuade nurserymen to alter their ways suddenly, for many people it is difficult to know what to do; but I should advise them to use seedlings when they can, and to do all in their power to induce the safest ways of increase on the part of trade growers. In any case it is clear we can make no satisfactory conclusion as to the cause of the loss of these plants if we only grow them in one way, and that not the natural one.

CLEMATIS MADAME EDOUARD ANDRÉ.*—This beautiful plant has proved a good kind in the country of its origin and wherever introduced. Prolific in shades of blue and purple, flowers approaching red have been scarce amongst Clematis, and, until the appearance of this—a variety vastly superior to the previous reddish forms of *C. viticella*—a really crimson form was unknown. Its appearance as the seedling of a French firm at Orléans marked a new departure amongst these lovely climbers, not only in colour but in form; for though a hybrid of *viticella*, it bears little trace of its influence, but in habit and character is related to the Jackmanni group, with all their robustness in growth and freedom of flower. The blossoms, 4 to 5 inches in diameter on well-established plants, and of good shape, are borne freely far into the autumn, not only lasting well, but preserving their colouring right to the finish,

* With coloured plate from drawing by H. G. Moon.

a good feature in flowers of blending shades. They are also of that peculiar velvety richness which seems to change in depth and intensity in different aspects. The flowers may indeed vary a little in size and tone in different places and seasons, but, given a fair chance, it may be relied upon as a rapid and vigorous grower, at once remarkable by the richness and number of its crimson blossoms. Used in contrast with lighter varieties it is most effective, or with the old white Jasmine or any similar creeper, serving to set off the intensity of its colouring. For use on a pergola or rustic archway, or to ramble over an old tree stump in a sunny aspect, there are few finer plants; but it should not be used, as sometimes recommended, stiffened and laid out in symmetrical beds, which, though producing a certain co-

lour effect, give little idea of the real beauty of the plant. In the south of France I have seen it used with the best results planted with the white-flowering Plumbago, or the Jasmine Trumpet Flower (*Tecoma jasminioides*), but in this climate it must have companions of a hardier character. Since the appearance of this Clematis collections have been enriched by a second good crimson, also of French origin, a gain of Mons. F. Morel, of Lyon, and named Ville de Lyon. Its relation to *C. viticella* is more apparent than that of the preceding, and its flowers, more regular in outline, are slightly smaller, but of a similarly rich tone of crimson and just as free flowering.

We hope to publish in our next number a classified list of all the best sorts by Mons. Morel of Lyon.

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HOW TO ENJOY THE WILD ROSE.

FOR many years, no one took much notice of any Rose except the heavy cabbage-like forms of "hybrid perpetuals," but now many begin to see that there are numerous wild forms worth having, and many single Roses are seen even at flower shows, certainly the worst places to see them. These wild Roses promise to have more admirers than ever they had in old times. Mr. Alfred Parsons' drawings for Miss Willmott's forthcoming Rose book will give us pictures of many beautiful kinds. Our own wild Roses over hedgerow, heath, and copse have, happily, never left us and are as pretty as any; but the great series of new kinds from other countries have very real uses for us, and it is not so much novelty that helps us as how to make good use of the best kinds—permanent use which will give us year after year some beauty without care or trouble. If we put these single Roses in the flower garden it-

self they may often be too rampant in growth, some being extremely vigorous, some flowering only for a short time, and some having other drawbacks, which, however, need not trouble us much if we put the plants to right use. The best plantation we ever made of them was above a long sunk fence that cut off a pasture field from a garden lawn. Sunk fences have usually "hard" lines, and in this case the hardness was got rid of by planting the whole of the upper side with a collection of the hardiest wild Roses. This was fifteen years ago or more, and the Roses have never given the least trouble since, flowering every year, tumbling over the wall and doing their work well all the year round. There are from twenty to a hundred plants in each group, according to the importance and value of the kind; and it is only one of the ways in which wild Roses may be used. They

can be grouped on poor rough banks ; by rides in shrubberies here and there, and in orchard fences. In many woods there are enough wild Roses already, but the American and other Roses deserve a distinct and separate place. For all such bold use of the wild Rose it is absolutely necessary to get kinds raised from seed or from cuttings, or any way but the evil art of grafting ; as if the more beautiful kinds are much in demand the temptation will be to graft them on the common brier, which would, of course, kill all the others in time, and we should have what we have already, perhaps, too many Dog Roses.

As these Roses in many cases root from the shoot like the Japanese Rose, and as nearly all bear seed very freely, there should be no difficulty in getting plants on their natural roots, and anything else should not be accepted as a gift. Some wild Roses, like the Marsh Rose, are excellent waterside plants, and may be grouped with fine effect near lakes or by streams, and in places where—even if we had the time or will to do anything so needless—it would be impossible to dig up the suckers of Dog Roses, as the more vigorous wild Roses got entangled among Willows, Dogwoods and other strong growing things of the waterside.

W. THOMPSON, OF IPSWICH.

WE regret to announce the death, at the age of 80 years, of one of the most active workers among hardy plants in England, William Thompson, of Ipswich, long known for his interesting catalogues of hardy flowers, enriched often by new plants of real beauty. He was a man of good education, who began life studying photography and chemistry, but gradually his love of plants led him to go into the work as a business, at first with but moderate success. Little by little he began the exchange and sale of rare seeds of hardy plants, and he published his first catalogue in 1855—a very slim one. Through correspondents in all parts of the world he was enabled to introduce to gardens a number of new plants, his first success being with *Rhodanthe maculata*, introduced from Western Australia. After that, the flower that brought him most note was the beautiful *Aquilegia cærulea*. He introduced *Godetia Whitneyi* and *Leptosiphon roseus* in 1871, and the lovely *Phacelia companularia* from California in 1885. As an illustration of the esteem in which he was held, it will be interesting to quote a dedication by Sir Joseph

Hooker : “Vol. 32 of third series, 1876.—This volume of the *Botanical Magazine* is dedicated to Mr. William Thompson, of Ipswich—to whose zeal in introducing and intelligent skill in raising hardy American plants, and especially those of the Western United States, European gardeners in general, and the *Botanical Magazine* in particular, are indebted for many most interesting and ornamental novelties—by his faithful friend, Joseph D. Hooker, Royal Gardens, Kew, December 1st.” Mr. Thompson’s friends included such men as Charles Darwin and Asa Gray. Mr. Thompson edited a monthly magazine called *The English Flower Garden*, which began in 1852-3. It was illustrated by coloured drawings. In 1855 he published “The Gardening Book of Annuals.” This was followed in the next year by a supplement, and a year or two ago—as the work had gone out of print—he was pressed to bring out a fresh edition, and he had sketched out and done some work towards a new one, which we hope his successors will issue in due time, as no one in Britain knew annual flowers so well.

THE OLEANDER.

As the old Georgian Orangeries sank into disfavour, to be replaced by the modern Conservatory, a number of old plants regarded as the necessary adjunct of the former also passed gradually out of fashion, among them the Oleander. One may still find the terraces of many of the old *châteaux* of Northern Europe ornamented by a row of Neriums, and for such uses the plant is well adapted. The vast numbers, too, raised for continental markets each year indicate that in many quarters it is still popular. Whether it is that owing to our uncertain climate its culture is really more difficult and unsatisfactory than upon the mainland of Europe, or whether due to the admitted proneness of the plants to harbour pests of all kinds, and their consequent disfavour, is difficult to say, but certainly a well-grown Oleander is one of the richest of summer-flowering shrubs. To realize the full beauty of the tree—for so, indeed, it becomes—it must be seen in the south of Europe, where, all along the Mediterranean, it flourishes, never failing, even with a minimum of care, to yield its gorgeous display. In no place can it be seen to such advantage as at Hyères, its chosen home in the south of France, and the great centre of its culture. First introduced into western Europe by the early Phœnician colonists, it has long been naturalized in many parts, more especially in the sheltered *vallons* and river bottoms of the coast, where at times it flowers in such profusion as to recall to Eastern travellers the summer splendour of the Jordan valley. Each year, for a good part of the summer, Hyères is a blaze of colour with the Oleanders that one meets at every turn in rounded clumps, 10 to 20 feet high and across, with flowers in all shades, single and double, from vivid rose to yellow and white, borne not in the sparse, half-hearted fashion with which our northern growers must rest content, but in a profusion under which the foliage well-nigh disappears. Such a tree becomes a landmark, visible for miles, and when the terraces and orange gardens are graced by dozens of such specimens, each with its fragrant load, the blaze of colour is a sight to be remembered. The fervid southern sun is

the prime factor in this floral triumph, but careful culture and selection have given rise to a number of varieties never seen in this country, with a wide range in form and colour, including dainty tints in mauve, carmine, and salmon pink. Success is wrapped up in the one phrase, *ripened wood* (for unripe shoots will not blossom), and to that end fullest exposure to air and light at all times. After flowering in summer (usually July) allow the plants a rest with just sufficient water to prevent injury, but the fullest exposure, preferably with reflected heat from a wall, as well as direct sunlight. In the event of heavy rain the roots should be kept dry by tilted slates or glass as a protection: these conditions reproduce as nearly as maybe the dry, later summer of its native haunts, when growth ceases almost as completely as in mid-winter. Upon again housing the plants do any trimming or cutting back that may be necessary, and encourage growth, which usually starts freely after the period of sufferance, but do not push the plants into some corner until the Chrysanthemums have done blooming—their frequent fate—or previous care will be thrown away. I suspect that the modern run on the Chrysanthemum, and the consequent crowding of houses for weeks together, when plants out of flower are pushed into the background, is responsible for not a few subsequent failures. When frequently sponged and kept in good order, the foliage of the Oleander is attractive, either in the green or the handsomely variegated forms. A sharp watch must be kept at all times for scale, red spider and mealy bug, to say nothing of *Aspidiatus Nerii*, its peculiar enemy, but good culture and healthy growth go far to secure the plants from such attacks. The Oleander may be readily increased either from cuttings of the ripened shoots in early spring, by layers, or even in water during summer, but the most satisfactory course is to get young plants, which may be had very cheaply and in good variety, from the best southern growers. The following list includes the finest named varieties in cultivation:—

Single-flowered plants, white, or slightly tinted—Adeline, album grandiflorum, Angèle

Darac, Emilie, Madame Dubois, Sœur Agnès, and Souvenir de Julie. Shades of rose, salmon, and crimson—*Atropurpureum*, *Delphine*, *Docteur Golfin*, *Emile Sahut*, *Jean Peyre*, *M. Balaguier*, *Professeur Martins*, *Souvenir de Cazalis Allut*, *variegata*, and many others. Shades of yellow—*Aurantiacum*, *Felix Bourguet*, *Maguelone*, and *jaune-nankin*.

Flowers double or semi-double, white or slightly tinted—*Amabilis*, *Madame Peyre*, and *Madonigrandiflorum*. Shades of rose, crimson, and purple—*Edouard André*, *Gilbert Bravy*, *Henri Marès*, *Laure*, *Madame Planchon*, *Pauline Lucas*, *Pierre Roudier*, *Professeur Duchartre*, *Professeur Parlatore*, *radianum*, *requiem*, *sinensis flore pleno*, *Souvenir de Félix*

Dunal, and *splendens giganteum*. Shades of yellow—*flavescens*, *Giardino Rovelli*, *luteum pleno*, and *Professeur Durand*.



SOUR STRAWBERRIES.—Many who grow Strawberries may have had opportunities lately of knowing too well the poor flavour of many of the new vaunted kinds. It is a mistake to exchange good old kinds for new, until we are quite sure of the quality of the new. It is the custom of the trade to value fruits for other reasons than the essential one of quality, and none of those we have recently tasted are as good as the old kinds, like *Keen's Seedling*, *Vicomtesse*, and, above all, *British Queen*. Thousands of Strawberries have been raised in England, France, Germany, and America, since *Myatt's*, of Deptford, raised this precious Strawberry, and it is still by far the most delicate, and the best of all kinds ever raised. Yet many gardens have not this fruit, and there is a prevalent notion that it is difficult to cultivate. This may be true in certain soils, but we think in much fewer than is generally supposed. It is thought that light soils are against it, yet we have lately had some of, perhaps, the finest we remember tasting from dry, poor loam; and Covent Garden is supplied from cool soils in Essex and Kent, as well as from rather lighter ones in Surrey. So perfect a fruit should be grown wherever there is any hope of growing it, and no points in cultivation should be neglected to secure a good result. *Vicomtesse* and *Marguerite Lebreton* are the best French kinds, neither of large size, but good in colour and flavour. The latter is the best early sort, coming in a fortnight or more before the

main crop, its fruits long and tapering, and very sweet. In many parts, especially the south, its fruiting season lasts into early autumn, but the climate favours a longer strawberry-season than ours. The importance of markets in our time leads to quite secondary qualities being preferred in Strawberries, such as those that will endure carriage, which means the worst quality that can be chosen for those who have to eat them. Strawberries that are merely good to endure the rough journey to the markets are rarely worth growing in a private place, and all who have gardens should resist the tendency of the trade to push such varieties or mere novelties of doubtful value. It is not a question of taste or pleasure merely, because the common Strawberry disagrees violently with many people, and is sometimes condemned by the leading doctors. We do not think the Strawberry should be blamed for this, because there is such a wide range of variety in kinds, just as in Pears and Apples there are kinds that are perfectly wholesome, and others the opposite. So it is with the Strawberry; a well-ripened and well-flavoured fruit is quite different in its effects from the sour fruits of the market.

CE n'est pas comme la botanique,—qui vous apprend à dessécher les fleurs et à les injurier en grec. L'horticulture vous enseigne à les rendre plus belles et plus heureuses.—
ALPHONSE KARR.

SYLVAN SHADE.

It is admitted by many who have lived under warmer skies than ours, that hot weather in the British Isles is more oppressive than in countries where the temperature is often much higher; and this, among other things, is a reason why we should pay a little more attention to shaded rides and airy shade under trees. We are not speaking now of work to be planned, but of what might often be done with things as they are. In a large area of country in the home counties many woodlands are wholly without airy and picturesque access, except for narrow rides closed up every year with briers and underwood. In two ways at least we might get very pleasant, shady ways: first, by making rides through home woods not less than 18 feet wide. I have been doing this to the extent of several miles during the past winter, and few labours are more interesting than finding the lines of greatest beauty and easiest grade through woods, bearing in mind ease of access; clearing the woods, shooting, shade and air. In olden times, when underwood was valuable, people begrudged the space to form airy rides, but this reason, never a good one, no longer holds. Making such rides in no way lessens the value of the wood, because every inch of the ground is occupied by the roots of the adjacent trees, and timber buyers and surveyors well know that the best timber trees often grow near such clearings. In making them, if (without marring their uses for the ends named) we can take rides beneath good old trees or

groves all the better, as beneath such trees the undergrowth lessens, and the clearance is easier. By all such rides the lower boughs of the trees should be removed without hesitation for the sake of showing the wood and stems; and as a rule such branches are without value to the tree if in a real wood. Nearer still to the house there is a second way of getting pleasant shade and air, and that is by removing without stint the lower branches of trees which are often a nuisance in preventing air and movement. In the case of fine old trees, the tree itself is very often trying to get rid of its lower boughs, and yet we often see them impeding all progress about the lawns. Where there are good rides through old mixed or evergreen woods it is important not to let the undergrowth close in on each side, as it is very apt to do. It is difficult to give an idea of the difference in the effect of such a ride when "light and shade" are let into it, and when, as is commonly the case, the Yew, Box, and other things are clipped back to hard walls, good views, fine trees, and groups being all shut out by this neglect. It is better never to clip in such cases, but always to work back to a good tree or group, and so getting room for the air to move, the shade of the trees above being sufficient in each case. The pleasure of driving or walking is much greater when the air is moving, and when one can see here and there into the wood on each side, with perhaps beautiful views into the country beyond.

AN EVIL ART AND ITS RESULTS.

IN buying a number of Willows some years ago, I was happy enough to find one of unusual beauty and grace—a weeping form of the Yellow Willow (*Salix vitelina*). This Willow is usually graceful in its habit, but this weeping form is pendulous, and I liked it for its exquisite beauty, fine colour throughout the year, and the usefulness of its abundant shoots, which tie like a good twine. I was fortunate in getting several plants on their natural roots, every one of which thrived, and in every stage looked well. Then, seeking more, a number were sent me grafted on the common Ozier, and in the case of these a very different set of circumstances arose. In the first place, you do not get a healthy tree, because the Ozier is not nearly so stately or fine as the Yellow Willow and does not form a good stock. There is a hard and ugly angle between the stiff stem of the stock and the abundant branches of the Yellow Willow. Death begins very soon, and comes in every case, if the shoots are not removed. The appearance of the grafted plants as compared with the other is simply piteous, and the plants are not only worthless, but a nuisance, because after a few years the stocks (of which we have already thousands in the woods everywhere) will become weedy trees out of place. It will at once be seen from this how much is lost by grafting trees in the case of Willows. By the labour in removing suckers (which is not likely to be done beside ponds and lakes that are out of the garden) we not only

lose our precious tree and its beauty of form everywhere, but we also establish a lot of wretched trees,—the very last thing we should want, perhaps—in a beautiful situation. This happened in almost every case of the grafted Willows, so that round my lakes I have a set of dying Willows or Willows arising from the stocks of kinds already dead. All Willows are easily grafted, and some of our finest Willows are usually sent out by the trade from cuttings, and, therefore, are safe; but the moment a Willow has any pretence of being rare, new, or graceful, then, for the sake of increasing it in the cheapest way, it is worked on the common Withy or Ozier, and every one of the beautiful Willows so worked is sure to be lost in time. I do not think there is one of these Willows that could not be easily increased from cuttings, layers, or seeds. It is very likely that, as far as gardens are concerned, many beautiful Willows have been lost from the practice of grafting; and it is a notable loss, because many of the Willows are among the most beautiful of plants, bushes, and trees we could possibly have beside or near water, which occurs so often in our country. The lesson of all this is that people should ask for what they want and refuse to have a grafted Willow on any condition. I have a line on each side of a stream of what is called the American Weeping Willow, a very graceful one. For several years at first they looked distinct and even beautiful; but, in spite of continual repression of the

suckers of the Ozier on which they are grafted, these have already got the upper hand, and the once graceful and distinct little line of gray weeping trees is now the most hideous funeral procession one could see. At the bottom a thick cloud of half-decayed wood and above the common Ozier, not half as pretty as it is in its natural growth. If our planting were confined to garden planting it might then be possible to control this, but the moment we begin

to plant in any right and bold way we must get out of the garden, and watching every tree for suckers is hopeless. A very little trouble would have sufficed to put this graceful Weeping Willow on its natural roots, which would have been a good state for its natural life ; but now I not only lose my trees, but I have to disestablish many Oziers out of place, which is not by any means an easy task.

* * *

IN THE JURA FOREST.—Among the hours of his life to which the writer looks back with peculiar gratitude, as having been marked by more than ordinary fulness of joy or clearness of teaching, is one passed, now some years ago, near time of sunset, among the broken masses of Pine forest which skirt the course of the Ain, above the village of Champagnole, in the Jura. It is a spot which has all the solemnity, with none of the savageness, of the Alps : where there is a sense of great power beginning to be manifested in the earth, and of a deep and majestic concord in the rise of the long low lines of piny hills ; the first utterance of those mighty mountain symphonies, soon to be more loudly lifted and wildly broken along the battlements of the Alps. But their strength is as yet restrained ; and the far-reaching ridges of pastoral mountain succeed each other, like the long and sighing swell which moves over quiet waters from some far-off stormy sea. And there is a deep tendency pervading that vast monotony. The destructive forces and the stern expression of the central ranges are alike withdrawn. No frost-ploughed, dust-encumbered, paths of ancient glacier fret the soft Jura pastures ; no splintered heaps of ruin break the fair ranks of her forests ; no pale, defiled, or furious rivers wend their rude and changeable ways among her rocks. Patiently, eddy by eddy, the clear green streams wind along their well-known beds ; and under the dark quietness of the undisturbed Pines, there spring up, year by year, such company of joyful flowers as I know not

the like of among all the blessings of the earth. It was spring time, too : and all were coming forth in clusters crowded for very love ; there was room enough for all, but they crushed their leaves into all manner of strange shapes only to be nearer each other. There was the Wood Anemone, star after star, closing every now and then into nebulae ; and there was the Oxalis, troop by troop, like virginal processions of the Mois de Marie, the dark vertical clefts in the limestone choked up with them as with heavy snow, and touched with Ivy on the edges—Ivy as light and lovely as the vine ; and, ever and anon, a blue gush of Violets, and Cowslip bells in sunny places ; and in the more open ground, the Vetch, and Comfrey, and Mezereon, and the small sapphire buds of the *Polygala alpina*, and the Wild Strawberry, just a blossom or two, all showered amidst the golden softness of deep, warm, amber-coloured moss.—J. RUSKIN.

OSTEOMELES ANTHYLLIDIFOLIA, that pretty little evergreen, is now (July 4) going out of flower, hastened by recent hot days, during which its place on the wall at Kew must have been a very warm one. It is a pity that this will not stand in the open, for it is not well adapted to a wall, and nothing could be better in form or effect as a bush, it being a neat, compact grower, fine in leaf, and bearing in June many sweet hawthorn-like flowers, succeeded by reddish fruits. In the south-west it would probably succeed thus, for the few specimens to be met with in the south of France are quite uninjured by sharp touches of frost.

FLORA

AND SYLVA.

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SEPTEMBER, 1903.

[Monthly.

SUMMERS LOST.

THE weather of the present spring and summer, and also that of 1902, might well lead lovers of the flower garden to reconsider its planting. Many have done so already, but many of the more important flower gardens in the country do not look as if their owners had the knowledge or the courage to do what is best, in our climate, from an artistic point of view. What is meant is well shown in the London parks, at Kew, and many other places where what is commonly called "bedding-out" is done on a large scale. Anything uglier or more ridiculous than the aspect of these places in the middle of summer of this year can hardly be imagined in the form of a garden made for pleasure. We thought of sending to photograph them, but it would be a waste of money to picture bare earth and scattered plants. Such folly is not only seen in the public gardens but one can scarcely visit a country place in which (whatever may be the case in the wild garden and shrubbery) the flower garden in front of the house is not still given up to the ugliness of bedding, and in seasons like this the best efforts in that way are

sure to fail. It is a bad, costly, and in-artistic system, and by the last word we mean wrong in every way for our climate, for colour, or effect. This year the weather has been such that, whilst it suited many hardy plants, the half-hardy ones have been knocked to pieces. Heliotropes which were put out in the best conditions have not, during the best half of the summer, in some soils, made more than an inch of growth. In light warm soils, like those of Scotland and Ireland and many parts of England, Pelargoniums and like plants suffer less, but in heavy soils they are a failure; even the lightest Surrey soils have not saved them this year. It is commonly said, in large gardens that are devoted to this bad system, that we cannot get away from it; but this is a mistaken view, because our fathers had very good flower gardens before "bedding" was invented, and mixed planting is better in every way. It is not fair to denounce a system unless we have something better to offer, and a far better course is not to sacrifice a garden to half-hardy plants. In a cold northern country like ours, in which frosts occur even in summer, it is folly to trust to tender plants

to the neglect of Roses, Carnations, Scarlet Lobelia, and the many beautiful hardy things which may be perfectly grown in our climate even in bad years. Where flower gardens are large enough it is much better to trust more to shrubs in the old way, that is to say, break up the surface so as to get a varied interest all over the ground, and so let in light and shade and variety. Among these shrubs should be choice evergreens, such as Kalmias and the finer Rhododendrons, which would give us evergreen effects and handsome flowers. Another reason for planting choice shrubs in the flower garden is that we may grow among them a number of beautiful bulbs; thus will the beds give a double bloom as well as more play of surface. This plan means that most beds of the flower garden could be

planted to last from seven to ten years and the flower garden would be very much more interesting even in winter, and would give us much less pressing labour in spring. If we wish for tender plants, it is better that they should be planted in smaller areas than is now the case, but we know that the most beautiful flower garden can be made without the aid of any half-hardy plants. An incidental gain of this true way of flower-gardening is, that we may work at it all the year round—in autumn, winter, spring, and throughout the summer—whereas in the bedding-out way all has to be done with a rush, and there is no time for the consideration of many points of colour and subtleties of grouping, succession, and arrangement, which a true flower-garden should give us.

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THE GREATER TREES OF THE NORTHERN FOREST.—No. 6. THE AMERICAN ELM (*Ulmus americana*).

OF all our native trees the American Elm, which is common to a very wide area, is unquestionably the most generally esteemed, not only for its beauty at all times, but for the variety of its numerous forms. It is our most stately and graceful tree, whether casting its shade over summer field or pasture, or rearing its noble shaft above its fellows in a wood, or arching its pendent boughs whereon the hang-bird weaves her nest, in a leafy grove, over village street, or city avenue. No tree is more airy or more lace-like in form during winter, or waves more gracefully in the autumn wind.

The Elm family, which includes some sixteen species, is extensively distributed through the boreal and temperate regions of the northern hemisphere (excepting western North America), reaching in this country to the mountains of South Mexico, where one species, *Ulmus mexicana*, is indigenous. Altogether five species are more or less known in eastern North America, while in Europe three species are named by the botanists—*U. campestris*, *U. scabra*, and *U. laevis*. The species common to this country are *U. americana*, the American, White, or Water Elm; *U. racemosa*, the Rock or Cork Elm; *U. alata*, the

Wahoo or Winged Elm; *U. fulva*, the Slippery or Red Elm; and *U. crassifolia*, the Cedar Elm. Of these, the White Elm is the most distributed and most largely cultivated. Dr. Charles Sprague Sargent, the eminent American botanist, thus refers to the White Elm in his "Silva of North America":—"The White Elm is one of the largest and most graceful trees of the Eastern States and Canada. It is beautiful at all seasons of the year; when its minute flowers, harbingers of earliest spring, cover its branches; when, in summer, it rises like a great fountain of dark and brilliant green above its humbler companions of the forest, or sweeps with long and graceful boughs the placid waters of some stream flowing through verdant meadows; when autumn delicately tints its leaves, and when winter brings out every detail of the great arching limbs and slender, pendulous branches standing out in clear relief against the sky."

The range of *U. americana*, or White Elm, extends from Newfoundland to Western Texas. It is the largest of its family, sometimes attaining a height of

The range.

over 120 feet, though out of its native home it does not grow to such a great size, and in England it rarely flowers and never ripens its seeds. The Rock Elm (*U. racemosa*), which sometimes attains a height of 100 feet, is an extremely striking tree on account of its often being free of branches for two-thirds of its height, and its fine, straight shaft, with its small head, reaching its finest proportions in Ontario and Michigan; but, owing to the value of its firm, close-grained wood, which takes on a high polish, it is becoming scarce. The Wahoo (*U. alata*) grows from 40 to 50 feet high, and

The Wahoo.

is not found north of Virginia. It is easily recognised by the fungous, cork-like substance which lines the branches on both sides. The Slippery Elm (*U. fulva*), which is found on the banks of streams, grows from 60 to 70 feet high. It is a common tree with large rough leaves and straggling branches, something in appearance between the White Elm and the Ironwood; its inner bark is much used for medical purposes. The Cedar Elm (*U. crassifolia*)—a graceful tree growing to a height of 80 feet—grows in Mississippi, South Arkansas, and Texas, though it is rarely seen under cultivation.

The White Elm, however, is the most beautiful of all, and it is seen at its best in the New England States, although many noble specimens grow in the

*The
White Elm.*

State of New York and elsewhere. Emerson, Holmes, and many writers have sung its praises, while nearly a hundred villages in this country are named after it. To Thoreau, in a moonlight night, a colony of Elms along a river looked like the columns of a portico wreathed with evergreens on the evening of a festival; while an Elm in the distance was like the vignette to an idyllic poem, suggestive of the quiet, rural life beneath it. In the autumn, dropping gold over the highway, they reminded him, both by their form and colour, of yellowing sheaves of grain, as if the harvest had indeed come to the village itself.

With the Hickory, some of the Maples, the Chestnut, Birch, and Aspen, the Elm contributes its yellow tints to the marvellous pageant of a North American October, its great size accentuating the blaze of its fine colour. Its mellow tones form a contrast to the intense scarlets of the Red Maple and the varied reds, salmons, and orange tints of the Sugar Maples, as well as emphasize the garnets of the Shad-blow, the ochres of the Sassafras, the crimsons of the Pepperidge Tree, and the splendours of the dog-wood Sumach and Liquidambar; the russets, maroons, and scarlets of the various native Oaks, and the rare buffs, ambers, and satiny greys of the Beech coming later to crown the glories of the waning year.

Although the Sycamore and the Tulip Tree attain a larger size than the White Elm, and the Oak surpasses it in rugged solidity, a fine tree of the White Elm can scarcely be equalled by any other tree for its combined grace and dignity. One of the finest living examples is the famous specimen at Derby Line, Vermont, close to the main street of the village. It is 102 feet high, its circumference (3 feet from the ground) 20 feet, and (5 feet from the ground) 18 feet 2 inches. This, with its relatively small head and giant trunk, straight and branchless for over half its height, is more like the picturesque Rock Elm, due from the fact of its having been a denizen of the original forest.

At Dauphin, Pennsylvania, in the lower Susquehanna Valley, stands a gigantic tree of a different type, known as the "Seven Brothers," referring to the main branches and not to the trunk. This forks symmetrically upwards and outwards from near the ground, forming a huge round head, while the tips of the branches droop like a Weeping Willow. The tree has a circumference of 24 feet, and a spread of bough of nearly 100 feet, and comes under the type termed the "Willow" type.

At Worcester, Massachusetts, stands a mammoth Elm with a peculiar growth upon the side, resembling perfectly the trunk of an elephant. It rears its colossal bole in the heart of the city, beside the common, and at the rear of the city hall. Its age is beyond the recollection of the oldest inhabitant, it having been an object of curiosity for a hundred years or more. The peculiar growth was undoubtedly caused by some accident to the tree when a sapling, but this has in no way affected the health or beauty of the Elm, which is one of the finest of this ancient town.

A splendid specimen of the umbrella type of the White Elm is the historic tree between Avon and Lima, Livingston County, New York, which graces the highway, or old state road, between Albany and Buffalo, originally the main trail of the Seneca, or Iroquois tribe, when they were the keepers of the western door of the "Long House." It is familiarly known as "the Umbrella Tree," and is very old; it was formerly a frequent trysting-place of the Indians. Its height is 100 feet, and its girth, 4 feet from the ground, 15 feet, and, while



AN OLD AMERICAN ELM (*ULMUS AMERICANA*).

Engraved for "Flora" from a photograph sent by George H. Ellwanger.

exceeded in dimensions by numerous other specimens, few are more beautiful. It has marked the passing of the stage coach of old, and hearkened to the whistle of the first railway train from the distant vale. It has viewed the forest's fall, and witnessed the tilth and largesse of husbandry supplant the Red Man's hunting fields. Years ago, the king of Apples, the Northern Spy, first bore its ruddy fruit almost near this tree; and when in winter snow and sleet have whitened its lofty crest and the winds have roared through its delicate spray, it has but smiled through the storm and dreamed of the caress of coming April showers.

Of other historic Elms which have already lived their allotted span, is the Penn's Treaty Elm, beneath which, in 1682, the Indian sachems and the Quakers met at Coaquannoc, the Indian name for Philadelphia, and pledged themselves to live in love with William Penn and his children so long as the sun and moon should endure. In 1810 the tree was blown down in a gale of wind, when, on counting its annular rings, it proved to be 283 years of age.

The old Elm at Pittsfield, Massachusetts, which was struck by lightning in 1841 and fell in 1861, measured 128 feet in height, with a trunk 13 feet 9 inches in circumference at a yard from the ground, and with an extent of 90 feet to the lowermost limbs. At the time the town was first settled, over 150 years ago, it was a beautiful tall tree said to be a century and a half old, which from the symmetry of its trunk, and its palm-like summit, was spared by the woodman's axe while the rest of its forest brethren were felled.

The Pittsfield Elm was figured in plates, platters, pitchers, and dinner services by Clews, one of the old Staffordshire potters that sent their beautiful dark blue wares in immense quantities to this country during the early portion of the past century. The view presents a winter scene, the town common, with the church and other public buildings. In the foreground is an enclosure with a skeleton tree intended to represent the famous Elm. The design of the church appears in three medallions in the border of the plate. Examples of this, like all other old blue historical pieces, have become extremely rare and are very highly prized.

Many of the arboreal patriarchs, so intimately connected with the history and progress of the country, that reared their verdant arches in majestic amplitude a few decades ago are now no more. "Where," asks Oliver Wendell Holmes, writing twelve years ago, "is the 'Great Elm' which looked upon Shawmut before Blackstone rode his bull through the woods where is now our Boston Common? Where is that huge 'Johnston Elm,' near Providence, which in the days of my early manhood spread its gigantic branches in full vigour, and offered its vast trunk to my measuring tape without feeling a quiver in its most nicely poised leaf? Where is the colossal 'Springfield Elm,' the only one I have ever found which would have dared to challenge the great English Elm I saw at Oxford? All gone, and many another wrecked or prostrate or vanished that I have looked upon in its glory."

The most revered of all American Elms and of all American trees is the Washington Elm on the south side of the Common in Old Cambridge, beneath which George Washington first took command of the American army on the 3rd of July, 1775. This tree, undoubtedly over 300 years old, is now, alas, in its sere and yellow leaf, and within a few years at most it must meet the fate of the famous Penn's Treaty Elm, the celebrated Charter Oak, and other sylvan worthies of a venerable past. Among very many other celebrated Elms are the Pratt Elm at Concord, height 85 feet, girth (1 foot from the ground) 22 feet, age 202 years; the great Elm at Westford, Mass., height in 1890, 90 feet, girth at 2 feet, 25 feet 8 inches, age about 200 years; and the wonderful vase-shaped Elm at Lancaster, Mass., height 95 feet, girth at 5 feet, 24 feet 1½ inches.

In longevity the American Elm may not compare with the Oak. It is a strong, rapid grower, and rarely survives two and a half centuries, the most vigorous usually showing the first signs of decay ere they have attained their one-and-a-half century mark. Impatient of drought, it usually attains its greatest beauty on fertile intervalles or river lands, or where its roots may find abundant and constant moisture. That it often flourishes so well in old homesteads is said to be owing to the nourishment it derives from the garden, or the moisture drawn from the well which its branches have shaded.

No tree presents such varied forms as the White Elm, this being even observable in seedlings where the trees have not been crowded, some growing closely together, some with a bare trunk and main branches, and others thickly plumed from the ground to the topmost boughs with short lateral branchlets.

These types are variously known as *the dome* which has a broad, hemispherical head formed by branches of nearly equal size, issuing chiefly from a common centre, and gradually spreading outward with a curve that may be traced throughout their length, a form naturally occurring in open spaces where the tree has not been interfered with by other arboreal growths; the *vase*, *bouquet*, *ewer*, or *wine-glass*, which very closely resembles a graceful vase, ewer or *flûte*, and the trunk of which is sometimes feathered; the *umbrella*, *parasol*, or *columnar*, that throws out its branches almost perpendicularly at a considerable height in the shape of a huge umbrella; the *Willow*, *drooping* or *weeping*, which has a strong pendulous character recalling the habit of the Willow tribe, and is generally a very large-growing tree; the *two-storied*, where the shaft is more or less divided by foliage; and, finally, the *plume* or *feather*, the most singular of all forms assumed by the White Elm. In this form the trunk, which is sometimes double, is feathered from base to summit with small branchlets, frequently inverted, as if it were clasped by a rampant vine. Some individuals assume most fantastic forms, and, viewed against the sky at dusk, look like some strange animal of mythologic times, or a gigantic bird with outspread wings pluming itself for flight.

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GEORGE H. ELLWANGER.

CYCLAMEN *: WITH SOME ACCOUNT OF THE MOST VALUABLE KINDS IN CUL- TIVATION.

PLANTS of much and distinct beauty, mostly natives of Europe or the colder parts of Africa and Western Asia, most of them hardy in this country, in which some may be naturalized in woods or shrubberies where the soil is of a gritty, leafy, or open nature. They are great favourites, having pretty flowers, some very fragrant and of long duration, and handsome foliage. The hardy kinds are of high value for the rock-garden, for planting under trees in the wild garden, and in shaded spots where few plants will grow. The Persian kind is one of the best greenhouse flowers, being grown largely for markets, and may be seen covered with flowers from November until April. In their native haunts the Cyclamen are found on rocks, sloping banks, usually under trees and in northern aspects; on chalky, stony, porous soil, out of the reach of stagnant water; or, as in Algeria and Tunisia, on dry, arid sand; the tubers always wholly or partially, above ground, amongst moss or herbs, and often buried in dry leaves which prevent the soil from getting hard frozen. If they are grown in gardens in open ground with no protection, the tubers may be injured in case of severe frosts. When planting, select a well-drained border or sloping bank of porous soil; if of a heavy nature add plenty of sand, leaf-mould, limestone, and pieces of old mortar. Plant the tubers when they are at rest, or from June to August

for autumn-flowering kinds, and from July to November for spring-flowering ones; surround the tuber with sand and take care that the top of the tubers is level with the ground. If the soil is dry, give a good watering and apply immediately a thick layer of sand, leaf-mould, cocoa-fibre, or moss. Be careful the first winter that the ground does not get frozen hard, as the tubers may be lifted out of the ground. In subsequent winters apply a dressing of leaf-mould and a layer of dry leaves, and let the plants remain undisturbed as long as possible. Hardy Cyclamens do well planted amongst shrubs or at the foot of a wall, being thus shaded during part of the day. They may be propagated in various ways but best by seeds. When fresh, these germinate in a few weeks, but when old they sometimes do not come up before twelve months or more, though they retain their growing power for ten years. Sow the seeds as soon as ripe in pans or boxes, in light, sandy soil; keep moist and shaded and in six weeks every plant will be up. Winter in a cold frame for the first year, and the following autumn plant them out at 2 inches apart. Among the numerous so-called species (and their many synonyms) there are only, so far as is known, six or seven really distinct wild plants; the sorts in cultivation are as follows:—

C. africanum.—This is the largest kind with a tuber 4 to 8 inches in diameter, black, flat, and irregular, emitting roots from all parts; leaves 6 to 8 inches broad and long, thin, ovate-serrate, sometimes angular, marbled with white above, purplish beneath; borne with the flowers, but not fully developed before December; blossoms

* With coloured plate of *C. libanoticum* from a drawing by H. G. Moon at Warley Place.



sweet-scented, an inch or more in length, pale or deep rose, with a purple spot at the base of each petal in autumn. The plant needs protection in winter if not grown under trees or in a cold frame; in cold districts it is scarcely hardy, but is worth growing in pots. Plentiful in Algeria and Tunis, in Oak woods.

C. alpinum.—A dwarf plant recently found on the Taurus Mountains of Asia Minor, at a high elevation; leaves faintly marbled and flowers pink. It may prove to be a geographical form of an old species.

C. Atkinsi.—A hybrid between *C. coum* and *C. ibericum*, raised by the late Mr. Atkins of Painswick. It is only a fine form of *ibericum*, from which it is barely distinguished by its larger foliage, sometimes shaded with whitish-green above, and by its larger flowers, white, rose, red, lilac, or purple. These hybrid forms are valuable plants for spring-flowering; beside their hardiness in open ground they make pretty effects grown in pans in a frame or greenhouse, giving in winter many bright flowers of long duration.

C. cilicium.—Mountains of Cilicia and Asia Minor, in forests of Pine trees near Mersina. Leaves entire or slightly serrate, purple beneath, and coming with the flowers in autumn; flowers pale rose or pure white, strongly scented, petals lanceolate, auricled, blotched with purple at the base; stalk spirally twisted after flowering; probably a form of the European Cyclamen, quite hardy and requiring the same culture.

C. coum.—A plant widely spread over South Europe, Asia Minor, Caucasus, Greece, and Syria, and the smallest kind; not above 3 inches in height. Tuber small, globose or flattened, 1 to 2 inches in diameter; leaves few, nearly round, entire or faintly serrate, dark green above and never marbled, deep purple beneath, showing with the flowers, which are small, deep purple, scentless, coming from December to March. There are several varieties in cultivation, all interesting plants on account of their early flowering, ease of culture, and hardiness, the leaves and flowers, even if frozen, remaining unhurt.

C. europæum.—Tuber rarely flat, irregular, black, emitting roots from all parts, often throwing up a persistent rhizome-like appen-

dix from its top centre, from which leaves and flowers appear; leaves reniform, deeply cordate at the base, firm in texture, usually entire, serrate, never angular, dark green, marbled with white above, purplish beneath, appearing with the flowers and remaining nearly all the year. Flowers purplish-red, darker at the base, very sweet, coming from July to October. There are several varieties, all hardy, and charming for the rock-garden; best grown in open limestone soil. Mountain regions of central Europe, Asia Minor, Greece, and the Caucasus.

C. græcum.—A native of the Caucasus, Crete, Morea, the mountains of Greece, and North Persia. Tuber large, reddish, irregular; leaves small, slightly marbled above, green or faintly tinged with purple beneath, appearing with or after the flowers, on long stalks, twisted after flowering: September and October. Flowers light or deep lilac (rarely white), with a purple blotch at the base of each petal, variable in size and colour and faintly scented. Not now in cultivation, or very scarce.

C. ibericum.—This is only a finer form of *C. coum* from the Iberian Caucasus, and a plant so like *C. Atkinsi* that the two strains frequently do duty for one another. The leaves have a white zone above; flowers purple, but varying from white to pale or deep rose, scentless; petals sometimes blotched with purple at the base. It is a good spring-flowering plant, requiring the same treatment as *C. Atkinsi*.

C. libanoticum.—This plant is another recent find in Asia Minor, occurring at a high elevation on Mount Lebanon. The leaves are orbicular, handsomely striped and blotched above, reddish-brown beneath, appearing in autumn and long before the flowers. These show during February and March, and resemble those of the European Cyclamen in size and form, white shading through light to deep pink in colour, with bright crimson spots at the base of the petals, and strongly scented. It is a hardy kind, of easy culture, effective in autumn for its leaves, and in spring for its early flowers.

C. neapolitanum.—A native of Italy, Corsica, Greece, and the south of France. Tuber flattened and irregular when old, 4 to 8 inches in diameter, emitting roots on all sides; leaves

variable, 3 to 5 inches long and broad, marbled with white above, purplish beneath, appearing in succession in a dense mass shortly after the flowering of the plant, and lasting until the ripening of the seeds in the following June; flowers of medium size, rose, red, or white, faintly fragrant, borne from the end of August until October. There are various forms and too many synonyms. Being hardy it is a good plant for the rock-garden.

PERSIAN CYCLAMEN (*C. persicum*).—Asia Minor, Greek Islands, and Syria. Tuber globose when young, flattened and depressed when older, of a brownish colour, 2 to 6 inches in diameter, emitting roots all around. Leaves ovate, more or less marbled with white above, purplish beneath, appearing with the flowers; flowers large, the petals oblong, ovate, four or five times as long as the tube, coming in succession from October till April, on some plants fragrant, on others scentless, and of many shades of colour. *C. persicum* is the most showy of the group, and new strains yield many variations not only in size, but form of petal, some being crested, veined, or plumed. A greenhouse plant of which the culture is now well known. In the warmer parts of the southern counties it may be grown out of doors in sheltered spots on the rock-garden.

IVY-LEAVED CYCLAMEN (*C. repandum*).—Native of South Europe, and the Greek Islands, ascending in the mountains of Corsica to a height of 6,000 feet. Tuber small, globose at first, depressed when old, producing roots at the base only. Leaves toothed, angular, 2 to 3 inches long, marbled with white above, purplish beneath, appearing in spring with the flowers, which are rosy white, fragrant, spotted with purple at the base of each petal. In various lists *C. vernum* is offered as a distinct plant, but there is no distinction in character. This kind is tender in some cold districts.

ENEMIES.—Sometimes plants look weak, the leaves are curled and yellowish, and in that case the tuber is often infested with myriads of a small greyish mite, and worms. There is no remedy but to burn the plant. Mice are fond of both tubers and seed, and often cause loss. Slugs are troublesome, eating the leaves, buds, flowers, and seed-capsules; a sprinkling of powdered quicklime around the plants will keep

them away. Green-fly, thrips, and aphids are most annoying, and are the result of want of air and moisture. A batch of Cyclamen beset with green-fly rarely recovers; these, and thrips and aphids must be destroyed in the usual way. Caterpillars will destroy the foliage of a whole batch in a week if left undisturbed. But one of the worst troubles is earthworms, often found in quantity in each pot; they make the soil sour in a short time, and often stop the drainage. Quicklime water, salt, nicotine, and several other remedies have been advised, but although they destroy the worms, they kill or damage the plants as well. An inoffensive remedy is a powder called "lombricide," which is applied as follows: put six or eight spoonfuls of the powder in a can of water, stir up well, and water the plants thoroughly when they are somewhat dry. Within half-an-hour every worm touched by the liquid will be killed.

THE CREEPING ROSEMARY.—The fragrant Rosemary, brought from Southern Europe hundreds of years ago, has shown little variation from its erect habit. With the exception of poorly variegated forms, none of them worth growing, no distinct variation has been hitherto known. This new plant is, therefore, a welcome variety of the old favourite, and likely to be as useful as it is distinct. It is a true prostrate form, and precious for use in the rock garden. A local botanist came upon the original plant by accident, in a garden in the neighbourhood of Nice, but no one could give further explanation of its origin, so that, whether a garden sport or, as seems more probable, a natural variety is uncertain. Though hard cut for propagation, this plant is now a fine spreading carpet several feet across, showing well its distinct habit, also clearly seen from the outset in young plants. Few plants are better fitted for a place on the rock garden, where the quickly-spreading prostrate shoots follow the outline of the stones, or droop prettily from a ledge. Seen hanging over a wall it would be quite as much at home, and, when covered with its pale blue flowers, the effect is good. Such a nook, amongst sunlit stones and in light dry soil, suits its sun-loving nature best.

HARDY PEA FLOWERS.

(Continued from page 173.)

TURNING now to plants of more distinctly herbaceous and alpine character, I may mention the Tree Lupins of California (*L. arboreus*) as a transitional link. These are, in fact, shrubs, raised with the greatest ease from seed, which will not stand a very hard winter, and cannot under any circumstances be expected to last more than three or four years. The commonest and best of them is the yellow variety, but there is a lilac which should not be introduced into the garden, as it crosses at once with the yellow and spoils the bloom of both. There is also now a white variety, which comes, I understand, more or less true from seed, and is distinct and somewhat of an acquisition. The common perennial Lupin (*L. polyphyllus*) is beautiful in leaf and flower (which latter varies greatly in shade), but after flowering it is one of the most unsightly of all the larger herbaceous plants. There is another species, *L. nootkatensis*, of which I have at present a large number blooming in this garden. I cannot see that these two species differ in any appreciable degree; for gardening purposes, at any rate, they cannot be called distinct. Of Thermopsis, closely allied plants, there are, I think, two species—both with yellow flowers—in general cultivation, and both of American origin. I have had *T. fabacea* here for many years, and am very fond of it; it seems to prefer a dry soil and to dislike shade. I have an idea that there is also a third species with purple flowers, figured in Royle's "Flora of the Himalayas," but if there is I have forgotten its specific name. *Baptisia australis* is blue, of a shade not appreciably darker or richer than some of the Aconitums. I nevertheless consider this one of the very finest among the taller-growing herbaceous plants; apart from the flowers, the habit is neat, and the foliage is singularly rich and beautiful. In a paper read before the Royal Horticultural Society, Mr. Wolley Dod mentions this among plants "that do not succeed at Edge." It seems improbable that a plant of this vigour should refuse to grow anywhere in the southern half of this island, so I assume that by "not succeeding" not flowering is implied, and this is to some extent my own experience, for in 1896 I had

no flowers, in 1897 the plant bloomed profusely, while on a still stronger plant in 1898 I had but four or five flowering spikes. There is certainly something capricious about its habit in this respect, though of late years it has bloomed pretty regularly.

Some years ago I bought for half-a-crown a plant under the name of *B. australis alba*, which turned out to be by no means white, but a palish blue of no particular merit; and I have also here *B. alba*, a plant which reached me as a "legacy" last year. It is alive, though at this date (June 1) it has made no signs of life, and its vitality and constitution, to say nothing of its floriferousness, all alike seem to be doubtful. A yellow species, *B. tinctoria*, bloomed here once, but died away, apparently having got its root into something that did not agree with it. It did not strike me as of much value or distinctness. The two varieties of *Galega officinalis* (purple and white) are both good plants, and, among the few Leguminosæ, easy to move. They are common in cottage gardens in the home counties. I am not aware that other species are in cultivation. *Psoralea macrostachya* has the merit, at any rate, of being uncommon, for I have never seen it in any garden except my own. It is a hardy herbaceous perennial, with rich ternate foliage, growing 4 or 5 feet high. The foliage is its best point, for the dull mulberry-coloured flowers are of no particular value. It flowers late in the summer and comes from California.

Of the perennial Peas, *Lathyrus grandiflorus* and *L. latifolius* are too well known to need mention. The former should never be admitted unless one is prepared to grant a lease of 999 years, for it is as ineradicable as the worst qualities of one's best friends. The white variety of the latter, which blooms later than the type, is one of the most beautiful plants of the whole order. It is not always quite easy to establish. One of the best of the Peas is *L. rotundifolius* (syn. *L. Drummondii*), with red, almost scarlet, flowers, and another distinct sort is *L. Sibthorpi*. This grows slowly, and appears to be far less vigorous than others of the species—it has not yet bloomed here—and another, under the name of *L. ochroleucus*, disappeared altogether soon after it was planted. Probably this is no

great loss, for the name seems to imply that the colour is undecided. The Californian Pea, *L. pubescens*, is a most beautiful plant, for which, I regret to say, I cannot find a suitable place in my garden. It does well, however, and flowers freely, in warm positions, with one of my neighbours. *L. magellanicus* (Lord Anson's Blue Pea) was given me a year or two ago, but I failed with it. The seed, however, came, I understood, from Chili, and not from the Strait of Magellan, and the gentleman to whose kindness I owed it told me he had no great opinion of it. "Lord Anson's Blue Pea," however, has posed as a sort of "vegetable sea-serpent" for so many years, since its portrait appeared in Mrs. Loudon's book, that one cannot help being interested in it.

There is a pretty Australian Pea with white flowers, a Swainsonia, of which I forget the specific name, but it is probably *S. galegifolia albiflora*, which I used to plant out during the summer months, and which, as it forms no taproot, did not appear to resent such treatment.

OROBUS.—In his relation to the botanist, the gardener, like

Panting Time, toils after him in vain,

And drags at each remove a lengthening chain.

in the shape of a concatenation of synonyms, under the burden of which he stumbles hopelessly. It is therefore, perhaps, rather ungracious to complain when the process is reversed and an old name is extinguished; nevertheless, the name "Orobis" is useful, for it expresses a race of plants which for all gardening purposes is totally distinct from the climbers, to which the name "Lathyrus" was formerly exclusively applied. These Orobi, to my mind, supply some of the most beautiful of spring and early summer flowers. The best known is *O. vernus*, of which there are several varieties, viz., white, the double white, and one with white and pink flowers, the latter not very distinct or valuable. The best of the lot, however, is a sky-blue variety, which is sold occasionally (though it is seldom offered) as *O. cyaneus*. This, however, is wrong, I am told, for the true *O. cyaneus* is a Greek plant with foliage and habit something more in the way of *O. canescens*, and is not in cultivation. *O. canescens* is one of the loveliest of Alpines, and

here, at any rate, is not only hardy but appears to thrive with vigour, it is a native of the Alpine regions of Western Europe, and is found in the Pyrennees as well as the Alps, Eaux Bonnes being one of its habitats; the true *O. cyaneus*, however, is not worth troubling about, for, as I learn on the very best authority, the flowers are not *blue* at all, but purple, and the constitution of the plant, as I have proved myself, is not to be relied on. *O. luteus* (or *aurantiacus*, for there is little or no real difference) is a plant of more vigorous habit than any of them with flowers of the shade of "old gold," and another most beautiful species is *O. roseus*, a native of the Caucasus. The only fault of this is that the blooms, which are of a rich crimson, seem to burn and fade—as is the case with others of the order, such as *L. rotundifolius*—too quickly under the influence of the sun. *O. roseus* appears to prefer partial shade, and, except seedlings, which appear in fair number round the parent plant, it cannot be safely transplanted. *O. varius*, with curious and beautiful yellow and red flowers, is not always easy to get true, and it appears to be impossible to keep for more than three or four years at the outside, though there is no doubt it is *perennial* in the sense that it is not *biennial*. A little further light thrown on the cultivation of this plant would be interesting. *O. lathyroides* is a taller plant with dark blue-purple flowers that blooms somewhat later than the other species. Slugs are fond of it. In Johnson's "Gardening Dictionary" I see mention is made of an *O. coccineus* from Vera Cruz, said to have scarlet flowers, which might be worth looking for.

J. C. L.

(To be continued.)

LAVENDER WATER.—It is rather funny to read how many papers echo the fiction that English Lavender-water is superior to any other. Those tourists so fortunate as to get the "essence de lavande" of Southern Europe at first hand are sufficiently aware of the difference, though by the time it reaches the English consumer it (in common with most of the flower-scents) is so diluted as to be inferior to what is made at home. The whole odour of the plant, concentrated by months of unbroken sunshine, is so much stronger than ours that the resulting essence must necessarily be superior.

GRACEFUL FORMS OF ASPARAGUS, HARDY AND TENDER.

THERE are, perhaps, no plants that have grown more rapidly in favour within recent years than the various forms of *Asparagus*, and for their beauty and usefulness few plants better deserve popularity. For lightness and elegance in form and outline, for their lasting character in various temperatures, whether cut or as plants, and for general ease of culture and freedom from insects and disease, they are of the utmost value. Their general adoption has been a main factor in the advance of modern floral art, with its trails of *Smilax* and its plumes and feathers of *Asparagus*-fern, replacing the heavy and crowded arrangements for so long in use. Their variety in aspect and habit of growth appeal to varied tastes, and the ease with which they adapt themselves to all sorts of uses as climbers, basket plants or trailers, whether for houses, hot or cold, rooms, or outdoors, place them within the reach of all. The family is large and widely spread, extending from China and Japan through Asia to southern Europe, and thence to South Africa, where by far the largest number occur. Save two or three, they are plants of the warm temperate zone, few species being hardy enough for the open and few needing more than greenhouse temperature. They succeed best in light, rich soil, require copious waterings during growth, and an occasional dressing of bone-meal or rotten manure. If grown for cutting they do best planted out, with a good light and a cool temperature; the resulting sprays are better than those grown in pots, and will last fresh for many weeks when cut. More heat and moisture result in rampant growth, but the growths are less useful and fade more rapidly, and the plants are more subject to pests. All may be increased by division, and for pot plants this gives good results, but most are readily raised from seed, and this is the simplest way. In the south of Europe their culture outdoors is very general, and the popular varieties are now planted in quantity to supply northern markets during the late autumn and winter. *Sprengeri* in particular does well, making free growth, which, when well ripened, is untouched by sharp frosts, though tender shoots

may be destroyed. As seen on terrace walls with such plants as the Parrot's-bill Lotus and the New Zealand Bramble (*Rubus australis*) it is fine indeed, the vivid trails, 6 or 8 feet in length, loaded in autumn with fruits, for size and colour like a red-currant, which spring up in all directions on falling to the ground. The combination of vivid green and glaucous grey, varied according to season by the crimson Lotus flowers, the tiny fragrant blossoms, or the red berries of the *Asparagus*, and relieved in places by the tufts of Bramble with its bright yellow spines and filmy outline, make such a show as is not easily forgotten. All the species are fine in leaf, some also for their flowers and berries, and we think that the half-hardy kinds might be made far more of a feature for outdoor use in favourable spots. Even *Sprengeri* will stand a good deal when grown cool; *acutifolius*, *declinatus*, *umbellatus*, and *caspicus*, are so nearly hardy, that if planted on a wall and well protected in winter, they will survive in mild districts, while several other sorts are perfectly hardy.

The popularity of the *Asparagus* has resulted in the multiplication of seedling or hybrid plants, in many cases hardly to be distinguished from the older types, though offered as new forms. A new and very distinct plant has been recently introduced, however, upon the Continent, and is to be seen at Kew, if not elsewhere in this country. It is a climbing plant named *A. Duchesnei*, a good grower, with foliage of dark green, the leaflets long and narrow, and arranged flatly in opposite rows, almost after the manner of a *Cephalotaxus* or Yew, but far lighter and less densely set. This new form is very distinct, and sure to prove useful, as it becomes better known. A second plant which has given rise to some little controversy is *A. myriocladus*, a seedling plant of the *A. retrofractus* type. Its form, as shown at Holland House, is good, with stout curving shoots holding themselves without support, and dense short foliage crowded into rounded tufts. Its habit is more compressed than that of the type, so much so as to fit it for use as a basket-plant. On first pushing, the young shoots are a pretty rose colour, changing to vivid, and finally to dark, green, with age and

New
varieties.

development, and when all three stages are shown on the same plant the variety of tint is pleasing. It is offered by the Ranelagh Nursery Company, of Leamington. A third new form is brought out by Messrs. Lemoine, of Nancy, under the name of *A. Sieberianus*, which claims a hybrid origin between *crispus* and *tenuissimus*. Its foliage is graceful and pretty, but so nearly approaches the latter species that it can hardly claim a distinct place amongst greenhouse Asparagus.

It may be as well to briefly review the older species and varieties of Asparagus, classed roughly in groups, based upon habit and foliage. *Acutifolius*, which grows wild on the hillsides in southern France, is a useful plant, its wiry stems and rigid dark green foliage graceful in trails, and sometimes reaching 12 feet in length. Apart from its beauty, the young shoots are eagerly sought by the peasants, and sold for the table at good prices, not only on account of their fine flavour, but also because coming in some weeks in advance of the ordinary Asparagus. It would be interesting to see what cultivation might do for this plant as a vegetable, but in any case, being hardy in our southern counties, it is well worth growing. The original "Asparagus-fern" (*A. plumosus*) has given rise to many seedling varieties, all of which have their own peculiar merits; thus *albanensis* has longer leaves and is less dense in foliage, though dwarf and compact in form; *cristatus* is less flat and more fluffy, with clusters of foliage at the end of each branchlet; *declinatus* is a drooping form, *robustus* a loose rampant grower, and *nanus* a dwarf kind effective in pots; *Sanderi* with a tall habit and dense tufted masses on the larger fronds; and *tenuissimus* with lighter green very slender trails, almost fluffy in its appearance, and the best for shower-bouquets and other dainty uses. *A. comorensis* has the general appearance of *plumosus*, but a more vigorous growth, a deeper green colour, and broader and less rigid leaf-fronds. *A. Sprengeri* is rapidly taking first place amongst useful Asparagus, and, whether as a basket-plant, a trailer for indoor rockwork, or the edges of stages, or simply for massing with heavier-looking plants, is most valuable. It comes freely from seed, and has given rise to

several forms: *compactus*, with a dense leafy habit; *ochroleucus*, the distinguishing feature of which is its pale yellow-coloured berries; and *variegatus*, a poorly variegated form, and by no means an improvement on the type, the white marking being weak and ineffective. *A. lucidus*, while preserving the general character of the last-mentioned, is distinguished by its much longer and broader leaflets, and its generally looser habit of growth, fitting it as a climber rather than a basket plant: China and Japan. Forming part of the same group, *A. sarmentosus* is another good cool-house species, marking the other extreme in its compressed bushy habit, and dense, almost tufted, sprays of a very deep green at maturity. This is one of the best for baskets, quite showy when covered with its wealth of fragrant white flowers, frequently followed by crimson fruits. South Africa. Following these plummy and frond-like growers, a third group carries light green foliage in rounded tufts from their branchlets, at once distinct and dainty. *A. retrofractus* and *laricinus* present this larch-like appearance, with vivid green knots of hair-like foliage, and stems woody and much branched, but the latter is by far the more vigorous. The new plant *A. myriocladus*, is by some considered a variety of the former, but in any case it is sufficiently distinct to stand on its own merits. Another species quite distinct from any of its congeners is *A. decumbens*, less reliable than the rest, but with a beauty of its own, more especially as a hanging plant or in a Wardian-case. Its slender stems require supporting or to hang freely with plenty of space, and are light, wavy and grey-green in colour. Its flowers are of the same small star-like type with an orange centre, and very sweet, but the fruit is large, passing from light green to light yellow, and produced more freely than most. Somewhat similar in habit and appearance, and adapted for like purposes, is *A. scandens*, but its foliage is bright green and borne flatly in rows giving it a more frond-like character. It is a vigorous greenhouse perennial, reaching 8 to 12 feet in length, and bearing orange berries, but a shy bloomer. A variety, *deflexus*, is somewhat smaller with a distinct habit; both from the Cape. Yet another perfectly different form is shown by *A. virgatus*, a strongly rooted, stiff-

growing plant of shrubby habit, spreading freely from the root. The cutstems, 2 to 3 feet long, and rigidly straight though feathery at the tips, are graceful for the centre of tall jars or vases, and last for weeks. The well-known *Smilax* (*A. medeoloides*) offers another complete variation in leaf, habit, and appearance. It is very free in flower, and in the south of France bears quantities of berries (which are not pretty) the young seedlings springing up in all directions from fallen seed. Though too rampant for many purposes, *A. asiaticus* is useful for large houses, growing a main stem of 30 feet or more in length with side-growths in proportion. Requiring more heat and shade than most, it is best in a warm conservatory or winter garden. Another warm-house species is *A. æthiopicus*, from tropical Asia and Africa, a fine plant with short falcate leaves, and climbing stems some 10 feet long: there are varieties from Natal and India. Other less remarkable greenhouse species are *A. africanus*, *Buchanani*, *Cooperi*, *racemosus*, and *ramosissimus*, all of which, save *racemosus* (India), coming from various parts of Africa.

The hardy and half-hardy *Asparagus* are not numerous, but include some good plants. Beside *acutifolius*, already mentioned, there is *A. Broussoneti*, a very fine climbing plant from the Canary Islands, and hardy in many parts of England. Its dainty leaves are slightly glaucous, the flowers very small, succeeded by small red berries. Three half-hardy species, requiring a warm corner and protection in winter are *A. declinatus* from South Africa; *umbellatus*, a shrubby plant from the Canaries; and *tenuifolius*, a perennial species from South Europe, the great feature of which is the handsome red fruits the size of marbles, borne in the autumn on wiry stems about 3 feet high. Of hardy sorts there remain *A. schoberioides*, a deciduous and uninteresting plant from Japan; *trichophyllus*, with light wavy stems 6 feet high, a strong-rooting perennial from North Asia; and *verticillatus* with thick woody stems and fruits like the common *Asparagus*, which is itself as beautiful a plant as either of these perfectly hardy species.

LANDSCAPE GARDENING ON THE THAMES.—Many people are rightly sensitive as to the

picturesque and natural planting of private grounds bordering our great waterway. It is therefore in some concern that a correspondent writes us as follows:—"It is lamentable to see the use made of the private grounds which come down to the Thames banks and form an unavoidable part of the landscape. I am sure that it is from ignorance that these are made into irritating eye-sores. I have just been to Goring-on-Thames, and am full of the subject! Below Streatley the grass meadows are mown and ornamented with cut-out and 'bedded-out' flower-beds. Just above Streatley, on the towing-path, is a new house with garden in front in full view. This is dotted over with fancy shrubs, each grafted on one tall leg. Even the standard roses contrive to look hideous. On the grass plot a green cat is watching over green poultry all in Box! The iron railings are red. Then, the Cleve islands, which used to be lovely, are all cut up into garden beds and gravel walks with rows of tubs,—scarlet Geraniums everywhere. On the Goring lock island these tubs are bright blue. The boathouses, which should, one would think, be simple in form and unobtrusive in colour, out-vie one another in gaudiness and expense. (The swans approved here are black with red bills.) I am confident that all this comes of having a wrong aim. The number of riverside houses is increasing enormously every year, which makes the subject urgent. It is cruel to see the lovely Thames being so utterly ruined."—E. F.

A NEW PAGODA TREE (*Platysprion platycarpum*).—Though botanists have found in this new kind sufficient variations to found a separate genus, from specimen sent to us by Herr Späth of Berlin, it would seem, for garden purposes, at any rate, to be a repetition of *Sophora japonica* except in its longer and broader leaflets and slight differences in flower which the European raisers have not yet been able to verify. In culture and requirements they are identical, both requiring light warm soils, and, when well grown, are fine trees of pyramidal form. The new kind, now in commerce for the first time, was raised from seeds sent to Herr Späth from the Botanical Garden of St. Petersburg.

ENGLISH DEER PARKS.

IN England, parks have existed from Norman times and perhaps even from earlier days. Thirty-one are mentioned in Domesday Book, in which venerable record *parcus* means a park, and *parcus ferarum* a deer park. Of these thirty-one parks, one only still exists with deer in it. Reredfelle of Domesday is Eridge Park in Sussex. A common error, which Stow and Dugdale have propagated, is that Woodstock, which dates from Henry I.'s reign, was the oldest park in England. No fewer than eight out of the thirty-one Domesday parks belonged to the King. Besides parks, *haia*, or hays, to the number of seventy or more, are mentioned in Domesday Book. These were enclosures in the forests for the purpose of entrapping deer which were driven in with horns and hounds. In size, a deer hay, if one may judge from one in Warwickshire, was about half a mile square. We are accustomed nowadays to think of the park as surrounding the dwelling or mansion house of the owner, but in the Middle Ages many parks were made on the poorest and most distant parts of the estate, far from the castle. The keepership of one of the royal parks was, in old days, a rare prize; and the younger brothers of knightly families were often made lodge-keepers of the ancestral park. The oldest deer parks were, apparently, all fenced with strong palings of oak. There is nothing prettier, and, though it is expensive, a good oak paling will last a hundred years with reasonable care in repairing. The oldest park wall, we believe, is that at Wootton in Staffordshire. It is of stone, 10 feet high and 4 feet thick, and was built in the reign of Richard II. Many of the smaller parks of to-day have been walled within the last couple of hundred years. Among the larger parks with fine walls are Ashton, Petworth, Woburn, and Wollaton. We cannot but deplore the increased use of hideous iron and wire fences for which the poverty or depression of the landed class may perhaps be urged as an excuse. Saxton's maps (1575-80) show 700 parks in England, but how many of these were stocked with deer it is impossible now to discover. We know from the Northumberland household book that the family of Percy were the owners of twenty-one parks containing 5,500 deer. These were distributed over Northumberland, Cumberland,

and Yorkshire, and there were also some in the South of England. Harrison, writing in 1577, complained that the twentieth part of the realm was employed upon deer and coneys already. Stow, in his "Annals" (1592), quoting Andrew Bourd, wrote that "there be more parks in England than in all Europe beside." He mentions deer, goats, and coneys, and adds, "for everywhere there is jolly maintenance of these kinds of beasts." In Moryson's "Itinerary" (1617) it is suggested that there were more fallow deer in a single English county than in all Europe besides. "Every gentleman of £500 or £1,000 rent by the year hath a park for them enclosed with pales of wood for two or three miles compass." After Elizabeth's time few new deer parks were made, and they probably began to decline in numbers. During the troubles of the Civil War many parks belonging to Royalists were destroyed by Roundheads. In some the deer were killed, in others the fences were levelled and the deer driven out. William Cavendish, Duke of Newcastle, was the owner of eight parks, but they were all destroyed except Welbeck. The King's parks suffered with the others. Marylebone Park was disparked under the Commonwealth, and 124 deer 'of several sorts' were sold for £130. When Cromwell's Government resolved to sell Hyde Park, the deer therein were valued at £765 6s. 2d., and Parliament enjoined that care was to be taken that no deer be embezzled or stolen. After the Restoration the parks were again restocked; and if the history of all the existing parks could be traced, we should probably find that the majority did not date farther back than Charles II.'s reign. The King of England, who at the Conquest possessed eight deer parks, is still, at the beginning of the twentieth century, the owner of four—Windsor, Richmond, Greenwich, and Bushey. Windsor Great Park, the second largest in England, is also one of the finest, and contains about a thousand fallow deer and a hundred red deer. The first mention of it is in the reign of Henry III. Cranbourne Park, which contains a small herd of white red deer, is really a part of the Great Park. Richmond Park, though now in the suburbs of London, has lost little of its natural wildness, the game coverts are still well stocked, and the heronry is undisturbed.—*Edinburgh Review*.

THE BEST CLEMATIS.

(Continued from page 184.)

It is not so long since the appearance of the first large-flowering Clematis but that many will remember the sensation created in the gardening world. As a result, growers in England and France set themselves to cultivate such plants as were to be had, and improve them by crossing the varieties amongst themselves, and with new species specially introduced. The appearance of *C. Jackmanni* redoubled their popularity, this beautiful hybrid being not only a plant of great merit for gardens, but proving to be the starting point of a race of hardy and vigorous plants so graceful in form and so free-flowering as to appeal at once to plant lovers, and lend a novel and artistic charm to gardens. Numerous varieties, so similar in general characteristics as to show a common origin, quickly followed this first great gain, and from amongst these older varieties a certain number are still in cultivation, kinds such as Prince of Wales, Gipsy Queen, Rubella, Modesta, Madame Grangé, Star of India, *rubro-violacea*, Etoile violette, Perle d'Azure, *Viticella venosa*, &c. Very many others, however, and particularly the hybrids of *C. patens* and *florida*, have almost disappeared, spite of their undoubted merits, their large and abundant flowers, appearing early and making, while they last, a far more effective display than do the hybrids of *Viticella* and *lanuginosa*. The majority of these forms have disappeared from gardens, not so much from any caprice of fashion (for no one had had time to grow weary of them) but as the outcome of a disease as mysterious as it proved difficult to combat, the appearance of which coincided as precisely with that of these plants as though it had been a veritable mission of destruction. One fact, however, set in bold relief by its ravages was the comparative immunity not only of *Viticella* and *lanuginosa* types, but of all their direct hybrids. This result has forced growers to a rigorous selection of varieties and the choosing of only such kinds as show themselves invariably healthy and robust.

These selected kinds we have sought to increase in number, and improve in variety of colour and beauty of form. To that end our care has been far less as to the size or shape of

the individual flower than of the general effect of the whole, of which the abundance and duration of the flowers, and the purity and brilliancy of their colours are the prime factors, enabling plant-lovers to obtain the richest effects in harmony or contrast. As regards the plants themselves, all but those of proved vigour and hardiness have been rejected; in fact, so robust are many of those here enumerated as to have reached the thickness of an old vine stem. Our list of varieties is classified according to colour as follows:—

YELLOW FLOWERS.—*C. tangutica*, the most beautiful of its colour, recently figured by *The Botanical Magazine* and *The Revue Horticole*. Flowers of a fine golden yellow, produced in spring and of the size of *C. montana grandiflora*. Stems woody and short, throwing out numerous flowering shoots each season. *C. orientalis*, light yellow in colour, flowering in summer and autumn; is best grown trained against a house or wall, when it sometimes attains a large size. Is quite hardy in England. *C. Wilfordi*, resembles the preceding; a plant for the rock garden, where it forms low tufts covered with flowers, its shoots taking root wherever they touch the soil.

WHITE FLOWERS.—*C. apiifolia*, somewhat like *Vitalba*, but flowering in autumn. *C. balaenica*, scented blossoms during autumn and winter. *C. cirrhosa*, a very vigorous plant, flowering from October to December. *C. flammula*, or Sweet-flowering Clematis, blooming in summer and autumn; a variety *robusta* is larger in every sense, and flowers a little later. *C. lanuginosa candida*, very large flowers, coming mainly in spring, but again at intervals (though but partially) during summer and autumn. There are in existence a great number of its forms, hybrid and otherwise, with beautiful white flowers, but none are so robust or lasting as the old form which has flourished for many years in our garden. *C. montana*, bearing sweetly-scented flowers in spring; its variety *grandiflora* is larger in flower, but they are not fragrant—common in gardens. *C. Viticella alba*, a good plant with flowers of exquisite purity and grace but somewhat fragile; its form *Luxurians* shows the same lovely white flowers, but is far more robust, attaining a large size, and sometimes, as a result of its great vigour, the first flowers are

somewhat greenish in colour. The varieties Arabella and Madame Moser are also forms of *Viticella alba*.

ROSE-COLOURED FLOWERS.—Comtesse de Bouchaud, large and beautiful flowers of a fine rose colour, and very free. Madame Baron Veillard, large flowers appearing rather late, towards the end of summer, and autumn. Vagabonde, flowers of four sepals set crosswise, pale rose in the centre, deepening towards the edges; a plant of great vigour. *C. Viticella rosea*, a charming plant, flowers smaller, but of a beautiful shaded rose, very free, and lasting; a secondary form, *reticulata*, has its flowers of a lighter rose-colour, netted with darker veins. Neige et cerise, also a form of *Viticella*, medium-sized flowers, white in the centre, with a border of bright cherry-red. Duchess of Albany, a hybrid of *C. coccinea*, with bell-shaped flowers of a good light pink; good for cutting.

CRIMSON AND RED FLOWERS.—Madame Edouard André, large well-shaped flowers of a beautiful crimson-purple colour; Madame Furtado-Heine, pretty rose-shaded flowers; Madame Julia Correvon, flowers of fair size and of dark crimson red colour; Oriflamme, medium-sized blooms, bright red approaching vermilion, covered with minute touches of white; *Jackmanni rubra*, a plant of good form, with reddish-violet flowers; Ville de Lyon, large flowers, perfect in outline, and brilliant crimson-red in colour—the best red Clematis. Amongst red forms of *C. Viticella* are Kermesina, small flowers but very abundant and deep crimson in colour; Leonidas, a hardy plant but less vigorous than some; flowers of a velvety purplish red, rich in effect; *Rubra grandiflora*, very vigorous and free-flowering, with flowers reddish-crimson; *Flore-pleno purpurea*, with very double flowers produced in quantity, on a vigorous plant, and *atropurpurea* bearing flowers rather larger, and of a deeper purple. *C. coccinea*, a perennial species with annual stems, the vigorous hybrid form *coccineo-Pitcheri*, obtained by crossing these two species, bears vanilla-scented flowers, deeper in form, and reddish-purple or a variable crimson in colour; Countess of Onslow, another hybrid of *coccinea*, with similarly shaped flowers, is a first-rate new plant for gardens; colour crimson shading to purple.

BLUE FLOWERS.—Durandi, very beautiful flowers of an intense bright blue; Perle d'Azure, very large light blue flowers, coming in rich profusion upon a plant of great vigour; Victor Cerèsole, a form approaching *lanuginosa*, with very large flowers of a good blue; Cæligina, medium-sized flowers of four stiff sepals set cross-wise, and a fine shade of ultramarine in colour; Bifrons bears flowers similar in size and good in form, light blue in the centre shaded to dark indigo at the edges, and silvery-white at the back; this double-tinting on the same plant has at times a very peculiar effect. Of purple forms of *C. Viticella* there are *atragenoides*, a very free and vigorous plant, with dainty blue flowers, paler in parts and towards the centre; *cærulea*, with myriads of bell-shaped azure-blue blossoms; and Monsieur Tisserand, robust and good, with light blue flowers streaked with darker veinings.

VIOLET AND PURPLE FLOWERS.—The purple Clematis are a very numerous class, but the best are as follows:—*C. Flammula rubra marginata*, flowers small but produced in such quantity as to make the plant one sheet of violet; blooms during summer. Etoile violette, large well-formed flowers upon a vigorous plant, which reaches a great size. Francofurtensis, a medium-sized dark purple flower produced in spring, and again towards autumn; Gipsy Queen, large flowers richly shaded and of velvet texture; the familiar Jackmanni and its variety *superba*, even more free than the type, and finely shaded; Madame Grangé bears a splendid flower, ruddy violet in colour; Modesta, with flowers, also very large, inclining to mauve; Neptune, with blooms equally fine and well-shaped, of clear blue-violet; Prince of Wales has rich violet-purple flowers, distinguished by a ruddy stripe in the centre of each sepal, and Rubella, very dark and richly shaded blossoms; Star of India, another high-class flower, clear violet, with bright purple markings; *Rubro-violacea* a peculiar brown tint of violet, passing to ruddy violet-crimson, with darker veins in the centre, a combination rich in effect but very difficult to describe. Amongst forms of *C. Viticella* are Iris, with medium-sized veined flowers of rosy violet; Nègresse, a very dark velvety purple; Venosa, large flowers of pale blue, veined with

violet purple, passing to darker tones at the edges; and *Venosa violacea*, a form of the last-named with smaller flowers, darker in colour; *C. odorata cœrulea*, with very sweetly-scented blue flowers, would appear to be a natural hybrid; it is a small grower but most abundant in its flowers, which are much in demand at Lyons for bouquets.

This rapid review may serve to give some idea of the rich selection now at the disposal of growers, an assortment capable of endless combinations according to the effect required. Nor does this include a number of varieties still on trial in our gardens, which promise ere long to add to the list plants distinct in form and colour, particularly in the newly-developed group of hybrids of *coccinea* and *megalantha*, of which the beautiful kinds Countess of Onslow, Sir Trevor Lawrence, Duchess of Albany, Duchess of York, and Grace Darling form a part.

FRANÇOISQUE MOREL, Lyon.

A NEW GARDEN FOR THE HORTICULTURAL SOCIETY.—Sir Thomas Hanbury has made a very graceful gift to the Royal Horticultural Society of the late Mr. Wilson's grounds at Wisley, near Woking, Surrey. This may prove a precious gift to the public through the Society, and we hope that it will be worthily used. If we may venture to offer any advice it would be against the practice of such market-gardening as is carried on at Chiswick. We should hope also that such a garden might be a beautiful one to see—the element of beauty should be above all things considered, and the place designed as a whole by some experienced landscape gardener. The collection of such trees and shrubs as grow well in our country should, we think, be one of the prime objects of such a garden, and the things that endure the climate of our country before those of tropical lands. A weak point in societies is the absence of individual responsibility, and it might be worth an effort on the part of the Society to remedy this in part by trusting more to men of proved capacity and experience; for instance, to Mr. Nicholson might be entrusted the choice of trees and shrubs to permanently adorn the garden. The gift is one we must all be grateful for—its permanent value will depend wholly on the way the gar-

den is designed and managed. In that beautiful Surrey country any repetition of the garden design known in London as “architectural” would be hopelessly misplaced, and if any site invites the English, or picturesque garden, it is this at Wisley. The essential thing is that the superintendent of such a garden should not only be trustworthy, but trusted. Leaving out any reference to living people, the best examples of good public gardening have been managed by good gardeners—such men as the late David Moore, James McNab, Robert Marnoch, or John Bain. The worst of all ways to manage a garden is by a committee, and no manager of a garden, who is a mere tool of committees or secretaries, can ever give distinction or a high place to any public garden.

SWEET-PEA, SCARLET GEM.—For many years past a scarlet flowering Sweet-Pea has been a cherished dream amongst raisers of this popular flower, but hitherto without success, though advances have been made from year to year in the increasing brightness and purity of colour shown. There are several kinds in part red, or reddish crimson, but always too much blended with half-shades to be called scarlet. The new plant shown recently by Messrs. Eckford fairly realises, however, the desire for a self-coloured scarlet flower, being nearly as brilliant as a scarlet Geranium, free in flower and a good grower. If it proves as fragrant as it is good in colour Scarlet Gem will be welcomed by all lovers of the Sweet-Pea. Amongst a perplexity of named varieties the following are noticeable as showing bright clear shades or effective contrasts in colour: Gorgeous, a dainty blend of salmon and rosy-pink; Catherine Tracy, a pure light blush; Princess May, an equally delicate shade of mauve; and Blanche Ferry, with good contrasts of rose and white. Coming to brighter tones, Firefly is a good flower of deep shaded crimson; Lady Penzance, a dainty light rose; and Miss Willmott, a large bloom very bright in colour; either of these would look well under artificial light, a table dressed with such shades always showing very cheerily, Shahzada is a good crimson-purple flower, but too dark to please all tastes though striking as a contrast.

SUCCULENTS AND THEIR USE IN GARDENS.

FOR many years Cacti and Succulents have been out of fashion, banished to botanical gardens, cottage windows, and the back-shelves and corners of garden and glass-house. Though the tide can hardly yet be said to have turned in their favour there are signs of increasing interest in them, while the attention paid to the hardier forms have given them a new value for the open-air garden. There is no class of plant which gives a better return for scanty care, and few in which effective results are more certain. Though their interest for the garden is in the main confined to a few months, and that for a restricted number of kinds, they may be used with great effect, and the simplicity of their culture at all times is a point much in their favour. Grouped with Yuccas, Cordylines, and other fine-leaved plants, they give a striking interest to gardens in which a good collection can be found, and their strange forms appeal to many. There are, indeed, few that have seen the great American Agave (so persistently mis-called Aloe) in full beauty, or others of the larger Mexican Agaves, that will deny their claim to a beauty all their own. Those spring giants, *salmiana* and *ellipsoidea*, one of whose dark green leaves when full-grown, is a load for a man; the fiercely-armed *ferox*, slower growing but majestic; *applanata* with its bluish tint and purple spines, graceful even when tiny; and *franzosini*, its leaves sometimes as pale as frosted-silver. The smaller kinds, if less imposing, are, many of them, really beautiful with their hairy or spiny edges, their variety of form, and frequent oddities of reproduction. Nor is the Old World to be outdone with its numerous forms of Aloe, easily distinguished from the western Agaves by their brighter blossoms, coming each year without injury to the plant, their truly fleshy, rather than fibrous, texture and distinct manner of growth, not to mention botanical details less marked. To see such *Aloe ferox* as grow in Mr. Hanbury's garden at La Mortola, with their towering orange spikes, the coral-pink kind, *Hanburyana*; bushes of *A. arborescens*, 6 feet high, and aflame with flowers; or *A. Dykiana* yet more brilliant, is a revelation to

those who only know such plants in their comparative feebleness. Grouped with the great Tree Yuccas, 20 feet or more in height, with Prickly Pears (*Opuntias*) of every shape and form, with strange Euphorbias and Bromeliads, and a variety of such plants as Dasyli- rions, Beshornerias, Fourcroyas, Nolinas, and Xanthorrhœas—plants hardly known in England outside Kew—it is possible amidst such surroundings to imagine the weirdness of regions given up to these and kindred growths.

Cacti and fleshy plants are so commonly classed together as Succulents, that it is best to draw some distinction, for though their culture is in great measure the same there are differences in constitution which make Succulents the more useful class for gardens. Cacti are slower growing in general, need more heat, are more impatient of moisture, and once out of health rarely recover, so that few kinds can be used outdoors without risk. Of Succulents, on the contrary, there are many hardy kinds such as Sedums and Sempervivums, and a great variety of half-hardy plants which may be used quite safely in the open during summer. Though little water is needed in winter, when in growth they can stand a good deal, and are often better for richer treatment than is safe with Cacti. For garden effect it is mainly with these, therefore, that we have to deal. The spot chosen for them in the open should be as sunny and sheltered as possible, yet free from stagnant air or moisture, for perfect drainage is the first essential. A dry bank may answer the purpose, though it is often better to prepare the spot by heaping a quantity of brick or other rubbish in some warm corner, covered with a good layer of soil strewn with rocks and boulders, amongst which the plants are massed. The background should be planted with clumps of Yucca, the hardier kinds to remain from year to year, those more tender planted amongst them during summer for variety, and as far as possible in groups of a sort. The Agaves are nearly all of them good, though few sorts are to be met in gardens or nurseries. These are best on banks, both for drainage and for effect—much of which is lost on a flat surface; when tilted well forward their natural habit is developed, and rain does not fall into the heart, with risk

of injury. For general use none are better than the old "Century Plant" (*Agave americana*), but when they are to be had any of the other big kinds are good. In buying such for garden use it is well to get three or five plants of a sort and in different sizes, so as to form good groups rather than the dotted specimens often seen. These other big kinds are rare in England so that young plants for grouping are best imported without soil from the south of Europe; they soon recover and make good specimens at small cost, and in the same way

African Euphorbias are too tender there are several hardy Milkworts very useful for our purpose, forming fine masses in contrast to the more rigid growers. *E. myrsinites* is a pretty prostrate kind and worth a place in any rock-garden; *biglandulosa*, a large plant of fine habit and grey, almost bluish foliage and yellow flower-bracts, soon makes an attractive tuft; *pilosa* is also good, and several other spreading forms from the south of Europe give variety and interest at all seasons. Of Mesembryanthemums there are many kinds which come



such of the larger Aloes as are of value for the garden may be had in quantity. Big clumps of the Ram's Horn Aloe (*arborescens*), the finely marked *umbellata*, the bright green *socotrina*, or the bluish *glauca*, are very striking in appearance; those previously named and the fine hybrids of Monsieur Deleuil are grander, but scarcer. The smaller Aloes, the Apicras, Haworthias, and Gasterias, though many of them beautiful, have no value for gardens. Having settled the salient points of the group with bold clumps it suffices to fill in the groundwork with smaller plants. Though the

in well, grown from cuttings laid on moist sand in full sunshine. The Hottentots' Fig (*M. edule*) with its quaint seed-vessels is one of the best, a rapid grower, and nearly hardy on our southern coasts. Almost any of the trailing or shrubby sorts can be turned to good account in clothing the stones used around the larger plants. Charming little nooks may be so made, responding to sunshine by a brilliant show of flowers either white, rose, purple, crimson, orange, or yellow. Of these nearly all can be well used except the stemless sorts, which are apt to damp off and are better under

glass. For rapid growth *cordifolium*, with its tiny red flowers, is useful, forming in a few weeks a cascade of greenery, or the Ice-Plant (*M. crystallinum*) with its glistening stems and leaves, always showy and easily raised from seed. Other annual kinds well worth growing for the Succulent garden are *pomeridianum* with golden flowers, and *tricolor*, either pink or white, a little gem in the sunlight. Portulacas, too, in a good year make a blaze of colour, lasting for weeks when the old flowers are removed as they fade. Clumps of Echeveria are very telling here and there for leaf and blossom; the larger kinds, such as *metallica* and *secunda*, are showy, *agavoides* and *Desmetiana* small but dainty. The Crassulas do not help much in the open, but such sorts as *multicava* and *spathulata* will grow in sunny spots between stones, and some of the bigger kinds can be used for awhile during the warmest weather with Rocheas, and such Kalanchoes as *glaucescens* and *marmorata*. There are several kinds of rambling Senecio to give brightness with their golden clusters during summer, and the best shrubby Sempervivums of the Canary Islands (such as *arboreum*) will bloom in hot seasons. The Chilian Oxalis (*O. carnea*), with its fleshy leaves, also gives a gleam of colour in autumn, and *Talinum patens*, a little shrub easily grown from seed, gives spikes of blue flowers and red berries quite in keeping with the more pronounced Succulents. Of Cacti there are few which it is safe to plant out, though many succeed in cold frames. Such plants as *Cereus Fendleri*, *Echinocactus Simpsoni*, *Mamillaria vivipara*, and several sorts of Opuntia from the Rocky Mountains are hardy in favoured districts, but none of these yield much effect, and the larger kinds of Prickly Pear, though picturesque, are tender and awkward to move. To fill such shady nooks of our Succulent garden as are unsuited to the tender sun-loving plants we may fall back upon the great variety of Stonecrops or the House-leeks, invaluable hardy plants which, with many of the Saxifragas, may be used to complete the general effect, forming tufts of rich beauty of leaf and flower; but their merits deserve a separate article. Where there are stones to drape, or bare stems to hide, the graceful Parrot's Bill Lotus (*L. peliorhynchus*), or a few cool-grown plants of *Asparagus Sprengeri* may

may be added, giving tones of grey or bright green. A rock-garden so formed is a novel and striking feature during summer, but it is important that no plants are placed in the open unless well-rooted and healthy, or, should the season be wet, loss will ensue. The tender plants, sunk in pots, must be housed before chilly weather sets in, and those hardier should not be exposed too long to the cold autumn rains, though if means of cover exist they are quite safe until actual frost. Thus, many of the bigger plants which need considerable house-room may be sheltered in a shed until the Chrysanthemums are fairly over. With a minimum of care and expense they are safely wintered in any light airy house, with just enough warmth to exclude frost and dry the air, and the plants as near the glass as possible to keep them dwarf and healthy.

A word of caution:—While in the open Succulents require constant guarding from slugs and snails, which come from all parts during damp weather to such toothsome dainties, and damage is soon done which it may take years to repair. B.

CLIMBING KNOTWORTS

(*Polygonum*).

THE herbaceous Knotworts are common in gardens, but the climbing and creeping forms are not so often seen, and even the best known are not often well used, nor are they, perhaps, sufficiently striking in appearance for the kept garden though well fitted for the wild garden. Amid such surroundings there frequently occur rough banks or bare places difficult to clothe—trees and bushes dead or spoiled in the lower limbs, which may be improved by draping—or it may be sheds or huts, necessary, but not ornamental in their strict plainness. For just such uses, the rampant Climbing Knotworts are well suited, being hardy plants, requiring, when once established, little or no attention. Planted in good soil, the space which they will cover in one season is surprising, and they spread each year with increasing vigour. Thirty to fifty feet of vigorous growth in one year is not unusual; indeed, they are just of that irrepressible type of growth which is best abandoned to its exuberance in half-wild spots where a few feet more or less of space is of little moment. Their flowers, too,

are of a character which harmonises with the surrounding vegetation, and truly beautiful in dense clusters.

THE TURKISTAN KNOTWORT (*Polygonum Baldschuanicum*) from Central Asia, and the finest in flower, is a plant of great value for draping low trees and bushes. The best way to increase it is to graft it upon cuttings of its own roots, or those of one of the other species. In all cases its own roots should be preferred, for apart from its being a more natural union, suckers will otherwise be a nuisance. It is needless to describe in detail its sprays of rose-flushed flowers, coming in quantity with very pretty effect during many weeks of summer and autumn. Too often it is set to climb an upright pillar or arrangement of hop-poles, upon which it hangs in a tangled mass, the pendant sprays battered by every wind. The most beautiful one we have ever seen was rambling along a low rustic fence, which served to skirt a steep overhanging bank in a wild garden, the spot, a sheltered but sunny glade, and its roots near a trickle of water which found its way over the bank. Here it had roamed to the far end of its support, gracing but not hiding the woodwork, while side shoots, straying away in all directions, hung out their flower-clusters in the most unexpected places. Some shoots had found their way over the surrounding trees and bushes, and others crept down the slope or hung over in a pretty way. Its profusion of rosy fruits as well as of flowers, made it a bright object for months together.

THE DOWNY KNOTWORT (*P. cilinode*).—A species introduced from North America, and little known, but of wonderful vigour, a young plant covering many square yards in a season, while its myriads of small white flowers borne towards the autumn are of good effect in the mass. For covering trees, thrusting its way through bushes, or to adorn a plain hedge-side, this variety is the best as not being averse to shade.

THE ARBOUR KNOTWORT (*P. multiflorum*).—A tuberous-rooted kind, from China and Japan, with shining deep green leaves and loosely spreading bunches of tiny white flowers on reddish stems. Its chief merit is its great vigour.

THE CURRANT KNOTWORT (*P. ribesoides*).—A pretty kind, less vigorous than some of

its fellows, but an attractive garden plant in the south of France. Its flowers are almost identical in character with those of allied kinds, but are succeeded by clusters of berries at first red, becoming white when fully ripe. Where it can be grown out of doors it deserves a place, but, being a native of southern Brazil, it is only hardy (so far as known) on the Mediterranean coast.

THE TRAVELLING KNOTWORT (*P. capitatum*).—This is a kind worth a place in any greenhouse for its beauty of leaf and flower. It is not a climber, but is better as a creeping or hanging plant, and a very useful one, being easily rooted and grown. It is quite at home in the cool greenhouse, or anywhere secure from frost, and is not particular as to soil or aspect. I once saw it used in masses out of doors in the south of France, and a lovely carpet it made, thickly set throughout the year with its rounded heads of bloom, light pink in colour, and not unlike one of the creeping Clovers in size and shape. In places warm and dry the flower heads were densely grouped, and the foliage dark and reddish; in other spots less exposed to the sun the velvety leaves, with their broad V-shaped markings and crimson stems, were more beautiful if the flower-heads were fewer. A few plants had spread so rapidly, rooting at every joint, as to cover within two years a very large surface, hiding an ugly dry bank under a pretty draping. A native of Northern India, it is too tender for such uses in this country, but as a basket or hanging plant for the greenhouse, and to cover bare ground beneath stages or in a winter garden, there are few plants would give so good a result with so little trouble. Dibbled into freshly-worked soil, not a shoot fails to root, and forthwith spreads, freely rooting as it goes.

GRAFTED CONIFERS.—These are offered by the thousand in some foreign lists. We thought that people had had enough of grafted conifers, or any other grafted forest trees. Grafting may be needed for garden varieties of such trees, but it is folly to attempt to grow forest trees, such as the nobler Pines of California, grafted; those who plant such trees will be wise in telling their nurserymen not to send them grafted plants.

ACONITUM (MONKSHOOD).*

THE most deadly of serpents is not more fatal in its venom than Monkshood : hence good reason for excluding it from the flower-garden, and, indeed, all gardens near a house. But some of us do not wish for even venomous wild creatures to be wholly exterminated, and for their beauty, some of the Monkshoods deserve a place—best in some rich, free bottom, near water. The best I have ever seen in effect were in such a place in a coombe in Somerset. In heavy, impervious soil the growth is slow, and the effect is rarely good in the southern and drier counties. The culture is of the simplest and the plants are readily increased by division in winter or spring ; seeds are also produced freely, and should be sown as soon as gathered. The plants, however, should be always confined to the wild garden, where in bold masses they will afford much beauty. Kinds of botanical interest only are not worth growing where good effects are sought, and those valuable for the garden are few in number.

A. Fischeri (Fischer's Monkshood).—As a garden plant this is at once among the best, and well worth growing in any collection of hardy plants. The growth reaches from 4 to 6 feet, terminated by a fine panicle of pale blue flowers. It is an autumn-flowering species from Siberia, and is synonymous with *A. autumnale*. *A. californicum* is also cited as synonymous with the above. From a garden standpoint, however, it is highly effective and the largest flowered of all the Monkshoods. The colour is a good blue. *A. Fortunei* (Fortune's Monkshood), also called *A. chinense* and *A. japonicum*, and by the latter is cited in plant lists. The plant is one of the finest in the intense bright blue shade of its flowers, produced on stout

stems and in large compound panicles, reaching 4 feet in height. *A. napellus* (Common Monkshood).—This handsome plant, with its numerous varieties, is the best known and most grown. Its varieties bicolor and versicolor are pretty in cottage gardens, the two being distinct in their blossoms. Under the head of *A. napellus*, *A. strictum* should be mentioned. It is similar in growth, but far more vigorous, and does not flower till late in August. *A. Kussvezoffi*.—A tall species, 6 feet high, with large dense panicles of pale violet blossoms. A good kind for woodland planting. *A. Wilsoni*.—A handsome plant, 7 feet high, with an immense pyramidal branching habit, came before the Royal Horticultural Society last year under this name. The plant, I believe, was collected in China, but would appear to be nearly allied to *A. Fischeri*. The flowers are pale blue. *A. Cammarum* is a blue-flowered species from Central Europe, the panicles usually few-flowered. A well-marked variety of this, *A. C. Starkianum*, is a fine plant, dwarf in habit, with few flowers, and foliage not unlike that of the Fair Maids of France. *A. heterophyllum*.—A distinct Himalayan species with pale yellow blossoms shaded with blue at the front. The finely cut foliage of many species is replaced by broadly cordate and toothed leaves ; it is also said to be non-poisonous. Height $2\frac{1}{2}$ feet. *A. orientale* (Eastern Monkshood).—With creamy yellow flowers, from Caucasus, Persia. A plant of tall growth, and heavily dissected leaves in some of its forms approaching *A. lycoctonum*, the Yellow Monkshood. *A. uncinatum* is a tall grower, 6 feet or more high, from North America, with lilac-blue flowers in loose racemes ; an excellent kind for the wild garden. *A. variegatum*.—A well-known species, and with its varieties, *bicolor* and *albiflorum*, frequently seen in gardens. Two of its varieties, *bicolor* and *albiflorum* are among the most effective for grouping in wild places. A new variety, known as *A. volubile*, is worthy of mention as being likely to prove very useful for this class of work. It is exceedingly vigorous, reaching 7 or 8 feet in height, with massive spikes of clear blue flowers, and its whole aspect bold and effective. There is such a rich choice of good yellow flowers for gardens that

* With coloured plate from a drawing by H. G. Moon.



the dingy Yellow Monkshoods are not worth planting, but in rough places where shades of blue, purple, and white are wanting, use may be made of any of these finer Aconites, and the fact that they succeed well in shade, or under trees, allows of their being planted in places unfit for many herbaceous plants.

SHELTER IN EXPOSED SITES.

[TO THE EDITOR OF "FLORA."—"I want to make a suggestion for an article which might be of great service to many of your readers—what shrubs and plants to grow in the rocky or poor soils on the crest of hills, probably subject to sea gales, where, on account of the view, much shelter cannot be given, and where there will be wind and dryness to be reckoned with? With the new fashion (for the old houses usually lie under the lee of a hill) of building houses in 'beautiful situations,' the question constantly arises, 'What *will* grow here?' and the usual gardener or the amateur cannot answer it.—R. C."]

In bygone years our forefathers, judging by the positions occupied by the majority of ancient houses that did not aspire to the rank of fortified castles, had little or no eye for beautiful views, since the greater portion of these dwellings command but a limited outlook owing to the secluded nature of the spots selected for their erection. Doubtless, in the troublous times of long ago, safety was the main factor in determining the site, and the house ensconced in a tree-embowered valley was more likely to escape the notice of a marauding band than one perched upon a hill-top. Nowadays, when peace reigns throughout the length and breadth of the land and the hill-tops are as safe as the valleys, house-builders are enabled to indulge their æsthetic tendencies to the full and hence it has happened that in some cases old houses have been deserted for modern mansions, on the same estate, commanding a wider view, while the prospect obtainable is the main consideration in determining the site of a dwelling to be erected on newly-purchased property. In the main, the present generation is a gainer through the altered circumstances, but in one respect (namely, lack of shelter) many breezy abodes of to-day compare unfavourably with the sequestered homesteads of our ancestors nestling in wooded hollows. To those who love their gardens the question of shelter is a most important one, for in an exposed situation, unless this be provided, it is practically certain that satisfactory results will not be attained. Shelter is obtainable from walls, but these are objectionable to

the eye unless covered with greenery, and even then their straight lines detract from the beauty of the landscape. There are, however, many living things with which we may fashion a wind-break that will enable us to grow plants requiring protection from the rude blasts. The first thing to be done is to provide an adequate shelter from the prevailing wind for the very subjects which will eventually afford the desired protection, for it is desirable that the rampart should become effective as speedily as possible, and unless the plants forming it start into growth at once and receive no check in their earlier stages this will be a lengthy matter. Even the hardiest trees and shrubs, if they are continually buffeted by rough winds before their roots have become thoroughly established in the soil, will make but little headway, whereas, if they are allowed to complete their first two or three years' growth behind a shelter-fence, at the end of that time they will be so securely anchored that gales will have but little effect on them. This fact was once brought home to me pointedly in a certain south-western garden where a row of *Cupressus macrocarpa* had been planted as a wind-break. Part of the row was protected against the prevailing wind by stout wattle hurdles about 4 feet in height, the other portion had no protection. Behind the hurdles the plants were sturdy and bushy little trees of 5 feet. The best of the unprotected plants were fully a foot shorter and had thrown out far weaker side-shoots, some had made scarcely any growth since they were planted, and others were evidently dying. A wind-screen is easily provided by reed or wattle hurdles 4 feet in height, securely staked, or a bank the same height may be thrown up. Another thing to be borne in mind in the case of a screen of trees is that the wider the screen the more ample is the protection. A width of twenty yards is better than ten, and fifty is better than twenty. The same applies to shrubs but to a less degree. As a shelter-tree none can excel the Holm Oak (*Quercus Ilex*), generally known by the popular name of Ilex. Wonders have been worked at Goodwood by its extensive planting, and at Abbotsbury, on the Dorsetshire coast, the far-famed garden is rendered secure from the wind by groves of this tree, for a gale blowing through a dozen Holm Oaks is a zephyr the other side. Of conifers the Monterey Pine (*P. insignis*),

Cluster Pine (*P. pinaster*), Weymouth Pine (*P. strobus*), Austrian Pine, Monterey Cypress, Scotch Fir, and Cedar of Lebanon are good provided they are planted in sufficiently wide belts. Yew is an admirable wind-screen, but is very slow in growth, and Holly may easily be kept low without becoming formal in appearance. The common Box makes a dense shrub, and *Juniperus Sabina*, a pretty spreading bush about 6 feet in height. Other shrubs useful for providing wind-breaks are *Euonymus japonicus* and *Escallonia macrantha*, both of which are used for this purpose in the Isles of Scilly, the latter being very pretty when in flower, but being tender is only to be recommended in the southern counties; *Berberis Darwinii*, of which I have seen hedges in Cornwall, is very bright with orange flowers in the spring. In Nicholson's "Dictionary of Gardening" its height is given as 2 feet. I have, however, seen it a huge, spreading bush over 25 feet high. *Veronica Traversi* makes a good 5-foot high shrub, and is practically hardy in the south. *Olearia Haasti*, *Skimmia fragrans*, and *Pittosporum tobira* may all be employed, and I know a hedge of *Pittosporum tenuifolium* near Falmouth. *Choisya ternata* is far from tender, but would be best on the inside line of the shelter-belt. Brooms of all kinds are useful, but with these, as with all other subjects that are not very close-growing, a considerable width must be planted to break the wind. *Griselinia littoralis* is sometimes made use of, and the Snowberry (*Symphoricarpos*), Osmanthus, and Jerusalem Sage (*Phlomis fruticosa*) will provide a low wind-screen. The Sea Buckthorn (*Hippophæ rhamnoides*) and Tamarisk are excellent sea-side shrubs, and may be planted even where they are sprinkled with the salt spray. Near Falmouth the Tamarisk is growing on a narrow beach which is covered by the salt water at high spring tides, but is in perfect health. The Buckthorn is extremely pretty when bearing its orange-berries. Both should be planted in good breadths to form an effectual wind-break. Even with such hardy things as these an artificial shelter in their early stages is advisable as it means saving of time in the end. Furze is an excellent commencement of a shelter-belt on windy hillsides, and should be sown where it is intended to grow. Shelter fences are only necessary where

rooted plants are put out, and are not needed when seed of any kind is sown. The common Laurel and Portugal Laurel cannot be recommended, as even in the south they often are badly cut in severe winters. Clipped Laurels are an abomination, and it is only when growing as a natural tree, 25 feet or so in height, and bearing its white bloom-spires, that this ubiquitous alien possesses any decorative value. The Sweet Bay, or true Laurel (*Laurus nobilis*), is far superior and hardier.

S. W. FITZHERBERT.

THE FLAVOUR OF FRUITS.—The indifference of many English people as to the flavour of fruits is curious to those who know that flavour is the main thing as regards the fruit we grow. It is folly to grow hardy fruits of poor quality, considering the time and cost needed to bring the Pear and Apple to a bearing state. Knowing this, we must say we have been taken aback by this note in Mr. Rivers' fruit catalogue:—"Within the last few years exhibitions of pears and apples have become so deservedly popular, that large varieties are absolutely necessary for those who intend to exhibit, as without size there is no chance of success, *flavour being entirely set aside*." And this from the house most famous for raising new fruits. These ideas, unfortunately too common, lead to the presence in gardens of much fruit of a poor quality. In our country the trouble is very often to get any fruit at all; and when we do get it, to have it of third rate quality is no great gain to us. Pears and apples quite common in gardens, and included even in the conventional list of first-rate kinds, have no trace whatever of a first-rate quality. The public have a truer appreciation than the professional grower, because we see, in the market, kinds of fine quality taking their due place; and the American, New Zealand and other growers have the wit to see that it suits them best to have first-rate kinds. So that the home-growers will soon have to face, in our markets, apples of the very best quality for cooking, or eating, like Sturmer, the Newtown, Spitzbergen; and pears, like Winter Nelis, and Easter Beurré, which are well grown in quantity in our Colonies and in America.

SOME NEW TREES AND SHRUBS OF WESTERN CHINA.

WESTERN CHINA is the back of the Himalayas. This great chain presents its steep face as a wall to India; its sloping side descends by successive terraces through Tibet, Yunnan, and Szechuan, to sink at Ichang into the great plain, which is there not a hundred feet above sea level. No such deeply-cut-up region exists elsewhere on the earth, hence the diversity of its plants, which are all the more interesting in that most of them can be grown in the open air in Britain.

If I were asked what were the most beautiful plants that I have seen, I should answer: Amongst trees, *Paulownia Fortunei*, which in Yunnan ravishes the eye with its myriads of violet Foxglove flowers, and the new species or variety of *Rhodoleia*, a giant tree in the great forests south of the Red River. Yet there are several species of *Rhododendron* trees which are perhaps more lovely than these. Of shrubs one may mention *Lonicera Hildebrandiana*, many new *Rhododendrons* and *Azaleas*, and *Ilex Pernyi*. Of the great climbers there are *Rosa gigantea*, the wild forms of the *Rosa Banksiae* and *Rosa indica*, and a certain *Porana*, which covers the barren rocks with a mass of flowers shining with metallic bluish-grey lustre. I prefer amongst herbs some of the *Cyrtandraceæ*, of which there are now perhaps a hundred species known from China; these have a delicate beauty, and recall the beautiful spots where they grow under the waterfalls in the dark recesses of the mountain forests. Of showy plants there comes to my mind the tall *Gentian* found in a deep ravine north of the gorges, which has been named *Gentiana venosa*. It has the port of a Lily, is 6 feet high, and bears ten or more large white flowers (they are 3 inches in diameter) spotted with green. Many useful plants are also found, as *Eucommia ulmoides*, a tree which has gutta-percha in every part of it; break bark or leaf or fruit and draw the parts asunder, they are held together by a delicate film of silvery threads of gutta.

One of the prettiest shrubs in the Ichang glens is *Itea ilicifolia*, which has leaves like yet not the same as the common Holly, and racemes of white flowers 6 inches long. It is

only far inland in the higher mountains that the gem of Hollies, *Ilex Pernyi*, is met with. It has prickly small leaves, scarce three-quarters of an inch long, and deep red berries. The non-prickly leaved Hollies around Ichang are legion; many of them are beautiful, as they excel in gloss of leaf. One of these, *Ilex coralina* (Franchet), is used by the poorer natives as a substitute for tea. In a wood of two or three acres in extent, behind some village in Yunnan, one can easily find more species of trees than occur in all Europe. Occasionally there are uniform forests at lower levels, made up of *Pinus densiflora* or *Pinus massoniana*, or of certain evergreen Oaks, or in Yunnan of *Alnus nepalensis*. These uniform forests are never of great extent and are uninteresting as regards variety; they are too open, and the sunlight prevents the growth of the many shrubs and herbs, which only thrive in deep shade. In the mixed forests one may find anything. In open glades rather high up *Lilium giganteum* may be spied miles away across the valley with its gorgeous turret of flowers. At still higher elevations and in complete shade in the mountains to the north I met with noble specimens of *Rheum officinale* (Baillon), the plant from which a considerable part of the Rhubarb of commerce is obtained. This is a glorious plant, having a remarkable rhizome 3 or 4 feet long, with a bright red cortex, but golden-yellow interiorly. Lower down in a dark wood we discovered, in one spot only, a few specimens of *Dicentra macrantha*, a plant much to be desired in cultivation. It grew with such plants as *Podophyllum versipelle* and *Caulophyllum robustum*. In an exceedingly dark mountain forest in Fang district in Hupeh, at 7,000 feet elevation, I found *Diphylleia cymosa* (Michx.), an American plant, astonishing to meet with in Central China.

It would be impossible to name all the trees of the mixed forest; many of my specimens are as yet undetermined. Of well-known genera, *Quercus*, *Carpinus*, *Fraxinus*, and *Acer* have numerous species. There is a new Beech with five kinds of Linden, four of these being new species. It was in sandals made of their bark that I used to do my climbing. Some of the new genera are worth noticing, e.g., *Dipteronia*, a very common tree, which is the only close ally

of the Maple known; it differs from *Acer* in having pinnate leaves and fruits which are winged all round the margin. *Tetracentron* is very remarkable; it has short lateral branches, on which are borne a leaf and an inflorescence of many small flowers. This tree grows to an enormous size and is very widely distributed in China. I discovered it in Hupeh, and years afterwards found it again south of the Red River close to Indo-China, where it is common in the forests. *Kædreuteria bipinnata* is another striking tree, with great panicles of yellow flowers and peculiar capsules. It is also widely spread, as it has been found by me in Hupeh, Formosa, and Yunnan. *Emmenopterys Henryi*, belonging to the Rubiaceæ, and with leaves rather like certain *Cinchona* shrubs, is a tree with one lobe of the calyx modified into a white bract, as in *Mussaenda*. This persists till the fruit is ripe, and serves not only as an attractive organ at the time of flowering, but as a sail to waft the fruit through the air. *Hamamelis mollis* is a tall shrub of the mountains of medium altitude. In the dark depths of the forest at 9,000 feet, north of Ichang, *Fragaria collina* (Ehr.) is seen with pink edible fruit. I have collected of *Rubus* probably sixty or seventy distinct species; not meaning by *species* the trivial distinction which is imported into the word when British Brambles are concerned, but meaning really different plants which no one would unite together. Many of these Brambles have fruit of exquisite flavour in the wild state. Currants were common wild in the higher forests of Hupeh in the northern mountains, and were splendid to eat. One species akin to *Ribes japonicum* has very long racemes of black fruit, I do not wish to say how long, but there are doubtless specimens at Kew to see. This shrub should be introduced. *Actinidia* is a genus little known in England. It has a good many Chinese species, all great climbers, simulating the Grape Vine rather in habit and appearance, and belonging to Ternstroemiaceæ; the flowers are snowy white. *Actinidia sinensis* (Planchon) produces in the wild state excellent fruit about the size of a big plum. This climber would be perfectly hardy in this country, and the fruit would be a great acquisition, I think.

There are a great many other fruits, as the various species of *Benthamia*, and I was almost going to forget the wild spiny *Vitis*, which has excellent fruit of a large size. I will, however, further only mention the curious *Pyrus Delavayi* (Franchet) of Yunnan. This produces large fruits, fairly edible, like an apple in shape. *Davidia*, a large tree, bears thousands of flowers, which are most peculiar. Inside a pair of white bracts, about the size of the hand, is a head of numerous red anthered stamens, out of which projects a champagne bottle-shaped gynæcium. This tree, in full flower, is a marvellous sight, owing to the alternate white and green, caused by these large white bracts intermingling with the leaves. *Hypericum longistylum* is an elegant shrub, with small leaves and flowers 2 inches across. *Ipsopyrum Henryi*, a mountain herb, is pretty, with blue flowers 1 inch in diameter. *Oligobotrya Henryi* is a common Liliaceous plant of the higher forests, with white flowers in a terminal inflorescence, thus differing from *Polygonatum*, which in other respects it resembles. *Petrocosmea sinensis* is a lovely little Cyrtandraceous plant with violet flowers and pilose leaves, which cling closely to the rocks on which the plant grows. *Abutilon sinense* is a tall and striking shrub, with flowers 2 to 4 inches across. It is of wide distribution, as it has been found not only at Ichang, but in Yunnan, south of the Red River.

AUGUSTINE HENRY, *The Garden*.

A NEW POPLAR.—*The Revue Horticole* reports the introduction of a new hardy Poplar named *Populus pekinensis*, from its native district in China. It is said to be nearly related to *P. adenopoda*, making part of the same group as *Populus alba*, *Bolleana*, *canescens*, *tremula*, and other species. In common with most of the Poplars, the leaves of *pekinensis* vary a good deal in different plants, but in the main are clear green above, sometimes bronzed, graceful and shining; the under surface clothed with a dense white down, giving the tree a silvery appearance. The young shoots, also densely downy, are either silvery white or reddish. The tree is said to be hardy, vigorous, and handsome, but no hint is forthcoming as to its habit, or size at maturity.

SIMPLE EFFECTS.

THOUGH lovers of plants will always do their best for every plant under their care, only such gardens as are unusually favoured by both natural and other advantages are fitted to be favourable to a large number of plants. For one such collection there are many gardens in which conditions of soil and aspect, climatic conditions,—which are often strangely local, whether upland, valley, or coast,—are all causes that may act against a great variety of plants. In such gardens the aim may be just as high, but circumstances forbid the highest success in most directions, but because people do not realise these limits much care and labour is wasted in trying to induce plants to do well in spots unsuited to them. Thus it often comes about that the plants which thrive best are neglected because they never give any trouble, in order that at much pains a poor result may be got from others less suitable. Now this is reversing what should be the case, and in a way that is bad from every point of view. There may be a certain amount of satisfaction in toilsomely preserving plants which, if left alone, Nature would at once wipe out of existence, but one may well ask whether the labour so spent would not be far better used if turned to more likely subjects. The method may seem hard, but to get the best results we should weed out from our gardens the crowd of crippled failures often much in evidence, the plants which only reward us at rare intervals, and all the weedy shrubs and nursery rubbish so common everywhere; everything which after a fair trial fails to give return in real beauty. The space and the care thus set free might then be given to such lines of effort as are often prompted by Nature herself; in other words, let each one find out what his or her garden will best grow, and leave doubtful plants to those better placed for dealing with them. Gardens are, in the main, a repetition of each other, the same plants a little better or a little worse grown, the same dabs of colour in beds and borders, a like medley in shrubbery and background. This is also, in part, the fruit of talk that all should grow this, that, and the other, concerning in turn every plant upon the market; a process which works out as “grasp all, lose all,” so far as concerns beauty and effect,

because too much is undertaken to be done well. In such a garden one may wander without being impressed by a single thing, or bearing away any distinct idea, one's own mind as confused as the plants passed in review. Some will say that one charm of the garden is its variety, and this is true where quality and quantity go together, and the blending of effects is done with the artistic insight which underlies a right use of good garden effects. Where means, space, and experience are limited a far safer *variety* at which to aim is that of form and grouping as between garden and garden, a plan, which, while allowing for individual taste is far more certain of good results, if only because it is easier to succeed with a few things than with many. Then again, the choice of plants is now so bewildering that few can hope to do justice to more than a part, and often a small part, of the whole. On every ground, therefore, since choice there must be, let it be of those plants which are most certain to give good effects, to the neglect of such as need what is imperfectly at command. It is true that such a choice must be, in itself, the fruit of experience (perhaps of experiment and failure), but if the work is rightly carried out there is not a doubt as to the final reward. Some of the most beautiful gardens, and often those in which one can learn the most, are those of just such limited aim and choice; gardens in which the grower knows what he can do well, and in which one sees nothing but good results, with no need to apologise for cripples here, or explain failures there, nothing but simple effects of things that visibly enjoy their existence, and nothing doubtful used in quantity until it has stood trial in some quiet corner. Small gardens must of necessity show somewhat of a mixture, but in larger ones it is easy to so vary matters as to avoid sameness even with a restricted choice. This may be done in many ways, and two of the best are *studies*, or, where space is at command, to go in for *broad effects*, by massing many plants of one sort into such groups as form a striking feature, and this, not in tender exotics—which can at the best only last for a few weeks, and represent a great yearly waste of effort—but in hardy plants which increase in beauty year by year, and once put in, need the least care and expense.

Often simple and good effects will come from the growth of one family of shrubs or plants. One such garden I have seen with a most beautiful collection of Lilacs, planted to hide and break the outline of a fence, beside a long path winding in and out amidst a variety of these shrubs such as I have seen nowhere else. They were varied by other shrubs and clumps of bulbous and other plants which thrive in partial shade. To wander down that path in Lilac-time was a thing to remember. Their guardian could tell which were the most fragrant, and which lasted best when cut, and which were really distinct from the mere florist's fancies, and other points of Lilac-lore. This is but typical of what may be done with a variety of plants and shrubs, either of one family, or it may be related only inculture, such as marsh and water plants, or hardy bulbs and tubers from many lands. The Violet, in its varieties, or any good hardy plants, may be so used. In no case need such studies mean the neglect of other plants; in fact, the aim should be a succession of such plants to complete as far as may be the floral year, and timed so as to allow to each its turn of care and admiration. Some of our best plants, the Rose, Carnation, Dahlia, and Chrysanthemum have their devotees it is true, but their special culture is mainly a round of shows and of hair-splitting variations, so that the distinction from a true garden standpoint is more of a loss than a gain to the plant, as giving a double and false standard of value. Plants merely good for exhibition are best left alone—our concern is for garden beauty only. Nor need the restriction be in any sense a botanical one. One of the loveliest garden-fancies I have met was what its author called a Garden of Spices, in which every plant was grown for its perfume, massed in great clusters, amongst which the bees held carnival—clusters the odour of which often greeted one at a distance of yards. The sweetest plants both in flower and leaf from the whole temperate world were gathered into a small area. Clusters of sweet Roses, Jasmine, Honeysuckle, or Lemon-Verbena stretched forward each from its own place, while bunches of blue Wistaria, fragrant Bignonia, and other less-known climbers, swung down in profusion from overhead. The whole was so beautifully graded that one passed by unseen stages from

tender exotics, through a long array of plants becoming increasingly hardy, until one wandered out at last amongst fragrant Pines and Myrtles, with a natural carpet of Wild Thyme, Rosemary, Lavender, and native herbs, with nothing foreign intermixed but seemed as much at home as the wildest of them. True, the spot was in itself unique—a long strip of undulating shore overhanging the Mediterranean, in a climate famed for its perfumes; but the idea might be adapted nearer home with plants that enjoy our clime, and any scheme which gets us away from the stereotyped garden and wearisome monotony of the ordinary "bedding" and shrubbery is worth attempting.—B.

RHAMNUS ANGUSTIFOLIA. — When selecting shrubs for the garden it is natural and right to choose, as far as possible, those with distinct merit of flower or fruit; still there are plants, possessing neither of these claims, deserving of place for their foliage and form, and amongst such this plant is a good one. In this country it is rarely seen in gardens, and, though more frequently used on the Continent under the name of *Rhamnus Perrieri*, is nowhere common. Though a variety of *Rhamnus alaternus*, it is very distinct, and far more useful than the wild plant common over the south-west of Europe as a straggling shrub or small tree, which varies much in size and habit, but is seldom good enough for gardens, the flowers small and green, and the dusky-red berries not showy. The variegated varieties, though better in habit, still betray too often the scanty looseness of the type. *Rhamnus Perrieri*, on the other hand, is a low, dense-growing shrub of garden origin and model form, its shining dark-green leaves of irregular outline well displayed and attractive at all seasons. For the rock-garden, where rampant bushes are out of place, or for use with other dwarf shrubs in winter bedding, this is a good plant.—B.

CRÉER des fleurs,—c'est le seul ouvrage pour lequel Dieu accepte des collaborateurs. L'art a créé des fleurs; quel doux orgueil s'il naissait une plante nouvelle semée par vous,—une plante qui n'existerait que dans votre jardin,—dont personne ne verrait les couleurs et ne respirerait les parfums que ceux à qui vous les donneriez, comme Dieu a donné les autres plantes à tout le monde.—ALPHONSE KARR.

BAD COLOUR IN THE LONDON PARK GARDENS.

THOUGH this may often seem to be a secondary matter to the gardener, it is really a vital one if we are to have beautiful flower gardens. There is an immense waste of energy in the direction not only of doubtful colour, but of very bad colour, and that too from plants often expensive to winter in houses. Why this should be is not so clear as is the fact that it is to the interest of all who have gardens in the open-air to have good colour, and not to waste their energies. Instances of this we shall give presently from gardens conducted without regard to expense and with much intelligence in other ways. One cause of the prevalence of bad colour is, perhaps, that plants grown in houses in winter, and looked at near at hand, are often attractive in colour, and yet are bad when seen under different conditions out of doors. Raisers and propagators of plants too rarely take the trouble to study the effect of them in the open air; if they do, then their judgment is at fault. No man who has given attention to colour would group or mass such things as the variegated Fuchsias, or the Iresine and tinted Alternantheras. Things that are bad in colour this and similarly cold years, may give good colour now and then under the most favourable circumstances. To this class belong the Begonias—now so popular—which are among the worst things we have for colour. It is indisputable that a great many plants that give this bad colour are tender or half-hardy, and can only be kept through the winter in houses and put out for a few weeks, while the best colours are decidedly those of hardy flowers—tufted Pansies, Roses, Carnations, Delphiniums, and other plants. We now give some instances of things seen in the London parks in the middle of August.

In Regent's Park much of the work done is good, the mixed borders showing well, and the sub-tropical and succulent grouping are as good as can be expected of such plants in such a season, but even here bad instances of what we mean are found. Thus, near the east corner entrance and close against a charming pool containing Water-lilies, are two oval beds of Golden Privet—always bad, and this year at

its worst—variegated Veronicas, Perilla, and other things equally ugly and hard. The effect is deplorable, not only from being out of place, but from being essentially bad in colour. And so on through the range of beds; Begonias come out very badly, the taller kinds such as *President Carnot*, battered and mournful, *fuchsioides* a failure, and *semperflorens* no better. *Cuphea platycarpa* is bad in colour however used, and *Lantana* is but a shade better. Variegated plants in general are very disappointing, whether Veronicas, Fuchsias, Geraniums, or Abutilons; one of the worst, *Abutilon Sowitzi*, is a study in bare stems and battered leaves. In Hyde Park there are far too many Alternantheras and carpet-plants; such things are bad at all times and in such a year as this have no redeeming feature. The blue Lobelias, overgrown, pallid and tumbled, are depressing, and many of the grouped Fuchsias are poor in colour, whether at a distance or near at hand. The very worst of them, that with the small variegated leaves, has the aspect of disease rather than beauty. Nearly as offensive are the forms with golden, patched, or bronzed leaves, as edging plants not worthy of a moment's comparison with Mossy Saxifrage or London Pride. Even a bold group of Bermuda Lilies, in themselves very handsome, is utterly marred by lines of dingy Fuchsias and Alternantheras with patches of dwarf scarlet Zinnias between, plainly designed for a startling contrast, and a failure at that, while much inferior to similar groups where the Lilies stand in their simple purity on a carpet of Mossy Saxifrage. In Battersea Park, exposed to the cool draught of the river-side, matters are even worse; the tender plants used for colour effect are in many places a complete failure; Iresine, Alternantheras, and Balsams with hardly a leaf left, Begonias mere battered wrecks, and Celosias sadly bedraggled. And yet all the choicest, the most sheltered, and the sunniest spots are given up to these poor exotics in order to give them a chance. With so many dull days these bad colours are cheerless and depressing in the extreme, the only thing that in any way retrieves such plants being a degree of sunshine for which experience should tell us it is often lost labour to prepare. In Battersea Park not only are these things seen at their

worst, but, to accentuate matters, shocking combinations of colour are seen, such as blue Lobelia, scarlet Geranium, mauve Verbena, with crimson and purple Fuchsias all crowded together within an area of a few feet, and distressing in their warring shades. Within a few yards from these a similar atrocity is perpetuated in blue and bright scarlet, with dull red Cupheas and bright pink and white Fuchsias,—some of the plants good enough in themselves, but hideous in combination. Here, too, are Cannas in great masses, without a trace of colour, and planted frequently where they can hardly exist and certainly do no good. Admitting that the season of 1903 with its heavy rainfall, rough winds, and changing temperatures is sadly against the flower-garden, there is surely the more need to study how best to light its borders with clear and good colours, and combinations of leaf and flower. There is, on the other hand, no better opportunity for noting the respective colour-values of plants than during these dark days, when poor things look doubly bad and the merits of such as are good are clearly seen. It would be well for all who undertake planting for bright effect to spend an hour or two in quiet study of these combinations, good and bad, as it ought to result in the avoidance of similar mistakes in future. It would be unjust to say there is not good as well as bad colour in these park gardens, but the ugly colours and combinations are so harmful in their effect on the public, and so often imitated by people with fewer means of growing the plants in question, that we think it best to look at the matter from that aspect, and so name examples that may be seen by all who are interested.

FORESTS OF THE HARZ.—We drove in a carriage and pair for miles by smooth roads, which wound upwards among endless groves of Pines, in squares of different ages, standing as close together as they could stick, all planted in rows. Every row was as straight as a line, vistas running forwards in endless perspective, left and right, as far as the eye could reach. What a revelation to one direct from the Himalayas, where no two trees are of the same kind or the

same age, and all are located by chance, as Nature sowed them. This was the Harz forest, the birthplace of forest lore. The country was divided like a chess-board into districts of 1,000 morgen, or acres, each under its separate officer. Each district is divided into ten stripes, or squares, corresponding to each decade of the century, during which period the proper square or stripe, where the oldest mature trees are, is felled and disposed of, and the 100 acres involved are replanted in rows, each row and each tree 3 feet apart. The decade is again subdivided, so that 10 acres are cut down and 10 acres replanted each year. Thus, at the end of the century every square has had a full crop of mature timber taken off it and been replanted with a new crop. The rule for thinning, which is also carried out at stated periods, is to cut out the overshadowed stems. Thus, the surviving trees are chosen, and the master trees only remain. The heads of the trees are always seeking the daylight, and thus the most rapid lengthening out is attained, and the side branches are crushed and drop off as they decay, leaving a straight-grained tree, free from knots. Thinning out is then performed, to let in air and light and promote the thickening process. The sale of thinnings pays all the expenses, and at the end of the 100 years the ground carries from 100 to 150 mature trees to each acre, of a value of, say, £1 per tree. The rent of this land for grazing might be about 5s. yearly per acre, so that from one acre of forest there is a revenue of over £100 in 100 years, or £1 per acre yearly instead of 5s. There is an important consideration always to be acted on—that of the effect of the prevailing wind. The tallest trees must always have the next tallest plot to windward of them, to protect them from the storm; and so the plots are arranged in steps like stairs each older lot being guarded by a younger lot, while the youngest lot is sheltered by the oldest of the next series of steps. At the end of any rotation period, the capital value of the growing timber must be fully maintained, or even improved, so that the annual yield, representing the interest of that capital, is a source of revenue as regular as clockwork to the State which owns the forest.—(“Forests of India.”)

FLORA

AND SYLVA.

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THE GARDEN BEAUTIFUL. HOME LANDSCAPE AND HOME WOODS. UNDER- WOODS AND WHAT TO DO WITH THEM.

IN our woodlands no plan was so firmly established as the underwood so often seen in the southern and other parts of the country, an old system, and for many years a profitable one. Underwood so planted and cut every ten years or so gave a good rent, while the "top" wood which arose among it was cut to profit now and then, the matured trees taken and the growing trees left. But this system is a good one no longer, underwood which once paid from £15 to £25 an acre only fetching a few pounds, and is often not saleable at any price. In hop-growing districts better prices for useful growths are paid, but, generally, underwood has ceased to pay much more than enough to mend the fences, and its cutting and clearing often a never-ending nuisance in woodland work. I often wish, looking at the masses of growth removed in one cutting of underwood, that the strength of it all had gone into tall Ash, Beech, or Oak, sound native timber instead of stuff so little in de-

mand that the men who buy it often leave much of it on the ground to rot. The question is important for owners with many acres of underwood, not even pretty to look at—poor, thin, worn-out growths—too often neglected. What is to be done? Generally we should convert as much as we could of the underwood into trees—slow work, and yet work that must be faced if our woods are ever to be worthy of our land either for profit or beauty.

Some account of what has been done on an estate with much underwood may be of interest. The woods are often on rough ground—slopes and gullies, with Oak, Beech, or Ash, standing amidst the underwood, so that it is difficult to fence against rabbits, as we do new plantations of little trees. In old woodlands the trees oftenest attacked by them are young trees freshly set out, so, to avoid the great expense of wiring, the plan adopted was to select healthy young saplings as tall as could be transplanted with safety (10 to 12 feet high), and to plant them at about 12 feet apart among the underwood stools, in the more open spaces. As they came from the nursery each bundle of trees was plunged at once,

root and stem, up to about one third of their height in a mixture of adhesive earth and fresh farmyard manure. The dip is good for the roots, and keeps off the rabbits for the first year: some mixture of quassia-juice or other offensive bitter will help in bad cases.

WIND-WAVING. — Wind-waving is almost as great an enemy as rabbits in the case of tall saplings, but was stopped in a simple way by *cutting off all the side shoots*. Strong young forest trees 10 feet high so treated showed no sign of "wind-waving," and grew well the first year. The leading shoot was not cut back, simply the side shoots which catch the wind. This is done before the trees are planted, and need not be repeated, as the vigorous young saplings soon come to anchor in the earth and are then less liable to wind-waving. *Instead of the heavy labour of staking we made each young tree a stake.*

NATIVE TREES BEST FOR REPLANTING OLD WOODLAND. — In selecting trees for this end, it is best to choose native trees, and for the most part Oak, Ash, Beech, Chestnut, Poplar, Sycamore, and White Willow. If we go beyond these it should be only for European and North American trees of proved vigour as forest trees. By planting these we have a chance of varying our ordinary woods, and we shall vary the wood best by planting each kind in colonies or masses, the trees intermixing with others on the outside of the masses. The planter should take advantage of every incident of the ground and variety of soil, and plant in accord as far as he sees his way—tree Willows by the streams, Beech on the dry hills, the Oak

in cool soils. The market value of timber should rarely influence the choice, as a few years often make a marked difference in the value of timber, and the best way is to plant the trees that make best growth in each class of soil. It would be wise in all cases to study the soil, climate, and other conditions that may affect the growth of trees, as some of these conditions are often not found out until we have made costly plantings. Even in our islands there are vital contrasts as regards tree-life—chalk hills and poor hot sands; stiff wealden clays; wide peat bogs; uplands with a light rainfall and hills and plains with a heavy one. Thus there are hills bare of trees for ever, and within sight of them, hills of the same altitudes thick set with our finest native trees. The best time to do the planting is as soon as we can after the cutting of the underwood, and as the preparing and clearing of this usually takes the whole of the winter, spring, and summer, we cannot plant until the following autumn, and do well if we get the trees in before Christmas.

REPLANTING WOODS WITHOUT GRUBBING. — So far as possible we should re-plant underwood without grubbing; a practical way if we baffle our animal enemies, as the underwood itself gives a canopy of leaves until the young trees provide their own. But costly as grubbing is, it is worth doing now and then, and in certain places, especially if we wish to plant evergreen trees. These are usually much better for being planted small, and therefore are not so well fitted to fight their way in underwood. In one case a slip of underwood came quite near

the house on the stormy side, and its frequent cutting was disfiguring, so the piece of rough ground was grubbed and planted with Holly, Cedars of Lebanon, Corsican Pine, Giant Arbor-Vitæ, and the Nootka Cypress, all in free groups. These took well and in a few years gave shelter and a fine evergreen grove effect from every point of view, far before those resulting from the ups and downs of the underwood crop. But treating woodland in this way is a costly labour, and only worth facing where there is a real gain in effect by the change from ordinary woodland to the forest evergreen growths.

RENEWING WOODS FROM UNDERWOOD GROWTHS.—If underwood has been well planted and it is not too old, it is often easy to get a great many young trees in it, if we avoid the common way of cutting too much. In some districts the underwood is mixed and we find clean saplings of good native trees which will thrive if freed from their neighbours. All underwood should be carefully marked before sale and every "teller" worth saving singled out and the number in each piece written down. If this is not done serious loss to the wood often occurs. Even if it be done, in many estates where the woodland is neglected and there is no resident agent or owner caring for it, the trees may be destroyed, not only the marked "tellers" being taken by the buyers but even young Ash and other trees of value; some woods are spoiled in this way. In a large piece of underwood cut this year by my own men, and not sold in the usual way, I was able to leave so many stout saplings of the underwood

that the wood now looks almost furnished. Ash, which when planted small is so quickly destroyed by rabbits, may often be saved in carefully cut underwood, young trees soon arising from healthy stubs. Nor should we fear to leave them pretty thick on the ground (6 to 8 feet is not too near if they so occur), as Ash is a wood useful in many states and thinning should not be done until the trees close together overhead. Even Alder may be left for the sake of its leaf-canopy. If patches of Hazel or Withy are here and there, then replant with stout Oak or Sycamore saplings about 12 feet apart. These trees resist rabbits the best of all that I have tried. Underwood buyers should be carefully watched, and where pieces of underwood are old, of little value, and not great in extent, it is often better not to sell, but to keep every "teller" that is worth keeping even as close as 8 to 10 feet apart, as useful thinnings will come in the following years—thinnings more valuable than underwood. Small pieces come in as faggots for home use, and the men have then no motive for destroying the most valuable part of the wood: but outside what is needed for home use any large cutting of underwoods is sure to end in loss by owners. Such tall saplings as are spoken of above must be sought for in nurseries for forest trees or raised at home. I have planted thousands of them every winter of late and have not lost five per cent. from any cause. Any smaller trees will not fight the underwood growth; but these keep up with it and, after some years, begin to meet overhead and then soon settle with the

underwood. In any subsequent cutting of underwood the young trees should be marked by washing them for 3 to 4 feet from base with a mixture of clay and earth with a little of lime in it, which will mark the trees so that no mistake need arise as to their cutting, and also help to keep off the rabbit, more likely to attack if all the undergrowth is cleared.

* * *

PRUNING OAK WOODS.—Not only is pruning unnecessary—for, if thinning is done gradually, allowing the Oak trees to draw each other up to such height as may be required, the lower branches will of themselves drop off—but it is injurious. This boughing of the Oak trees affects the value of the timber when felled, though the tree, when pruned, may be only twenty or thirty years, and when cut, 150 years old. When the boughs are thrown off by Nature, as they are under careful management, the bark gradually closes over the part from which the bough dropped and it is then not easy to define its former position, nor would any sign of it be found when the tree is cut; but should the tree be pruned, an unsound knot, or a sore in the tree, is at once formed, allowing water to penetrate the trunk where the limb was cut off. This causes rot, and a dead piece of wood will be found in the centre of the tree when it is cut. The bark usually closes over the wound made; but this takes some years, and, before it is closed, the mischief is often done; and in old trees it frequently happens that the closing over of the wound by young wood causes a species of dry rot within. In the case of Oaks that have to be boughed owing to their overhanging rides or drives, it is best to cut at 4 to 6 inches from the main stem.—R. W. C.

TREES AS SOIL DRAINERS.—The amount of moisture which a tree takes from the soil is greater than one might suppose. The Eucalyptus in semi-tropical, and the Willow in temperate climates, will frequently turn swamps into firm ground by sucking up moisture. This characteristic of trees extracting moisture from the earth and pouring it forth into the atmosphere partially explains why countries denuded of trees are so liable to suffer from severe droughts. Hence the wisdom of finding trees that suit wet ground instead of taking the often futile course of draining it. Among such trees, White Poplars, Norway Spruce, Sitka Spruce, Hemlock Spruce, Alder, and the White, Yellow, and Crack Willows may be used.

THE GREATER TREES OF THE NORTHERN FOREST.—No. 7. THE CHESTNUT (*Castanea sa- tiva*): WITH ENGRAVING OF A GROUP AT BICTON.

AMONG the noblest trees of the northern forest for its beauty and dignity even in our cold north, for use as food for various peoples, and for its wood and value in many ways. It is a tree of the sandy and granitic hills of central and southern Europe, the Caucasus, and North Africa. It lives to a great age and often, even in our own country, reaches great size and striking beauty, as on the terrace at Shrubland and many other places. It does best in free warm loams or sandy soils, and, like most of the other forest trees, it grows much straighter as timber when close together than when isolated as it is so often seen in our country; its effect is great, however, in either case, and old single trees are often beautiful. Its slighter wood is the best of all for poles, fencing, and trellis-work; even young growths split up are very enduring, and hence the common use of the tree in France, especially about old houses, for trellis-work against walls. The mean and ugly modern way of wiring a wall with galvanised wire is not so good as the old fashion of trellising with split Chestnut, often common as underwood in the very places where the wire is used. In forming a pergola its use is a help; if we make our pillars of brick or Oak, and our main timbers of Oak or Larch, the best wood to form the smaller divisions (and this is most important if the training of the plants is

to be good) is rent Chestnut made from underwood growth. The idea that the roofs of old buildings in England and France were made from Chestnut is incorrect, as they have been proved to be of Oak. Chestnut wood is best when cut in the young and growing state, as old trees are apt to become shaky.

Fine as the tree is in parts of our own country, it does not attain its greatest

still increasing in size and beauty towards southern Italy and Sicily. There, in the lower girdle of woods, Cork trees and Evergreen Oaks prevail, often growing out of the lava; but in a higher zone of this woody girdle, at an elevation of between 3,000 and 4,000 feet, the Chestnut is the great tree. The elevation and the soil (consisting chiefly of ashes in an impalpable powder) suit it



GROUP OF CHESTNUTS AT BICKTON, DEVON.

(Engraved for "Flora.")

size on the northern side of the Alps; not till we have passed the mountain chain which separates Italy and Greece from central Europe do we see it in all its strength. On the southern slopes of this mountain chain, much finer trees than any in England or France begin to appear, and as the traveller wends his way southward he finds the Chestnut

well, trees in that region being of gigantic growth, numbers of them far above the average size of the forest trees of Europe. Amongst these giants the *Castagno di cento Cavalli* is celebrated. Its aspect on a first approach is disappointing; the trunk is hollow, the weight of the branches having rent it asunder, so that the tree in its severed state looks

more like a group of five distinct trees all in partial decay. That it was originally one compact and gigantic mass is partly proved by the fact that on the inner side of the vast segments of trunk, that still in part surround the large open space that was once the core of the tree, there is no vestige of bark; the original unity of the tree is also shown by finding that at a certain depth below the surface the five separated portions unite in one solid trunk, its entire circumference being 204 feet, giving a diameter of 68 feet. Though such a size is probably unique, Massa, one of the most esteemed of Sicilian authors, states that, though he had seen Oaks measuring more than 40 feet round, he had seen Chestnut trees of greater size, indeed such as almost to strain belief. One of the largest of these is about a mile and a half higher up the mountain than the famous old tree, and is called *Il Castagno del Galea*. It rises on an erect and solid stem to a considerable height, when it spreads forth arms of great size, and is, in fact, a much finer object than the venerable ruin of the *cento Cavalli*. Two feet from the ground it is 76 feet in girth and 25½ feet in diameter. Another tree of nearly equal size is known to the Etna guides as the *Castagno del Nave*. Both of these, and many others but slightly smaller, grow in the deep rich soil formed of ashes thrown out of the volcano, and are found at a height of about 4,000 feet. In parts of Italy, France, and other regions where the Chestnut is much used as wood, there are many varieties, mostly increased by grafting on the common tree.

VARIETIES CULTIVATED FOR FRUIT.—

The fruits of the common Chestnut are small and poor, consisting of three nuts packed together; the husks surrounding each nut make them useless as food. The cultivated form yields a better fruit and exists in many varieties, of which the best are *Pourtalonne*, vigorous and fertile; *Verte du Limousin*, fertile, fruit large, well-flavoured and keeping well; *Exalade*, good in all respects save that the tree quickly exhausts itself in fruiting; and *Nousillarde*, a good kind with fruits coming true from seed. The kinds most esteemed for their fruit, however, are those distinguished in France as *Marron*, in which the three divisions found in the common Chestnut are united in one kernel, large, round, of fine flavour, and free from the inner divisions which so spoil the commoner sorts. To this class belong the famous Chestnuts of Lyons, of which that town is only the central market, the fruit being grown in the mountain districts of the Cevennes, and of Var and Alpes Maritimes where the soil suits the trees, which are very productive. Thus the annual yield of fruits in these two southern departments and the island of Corsica is valued at about £200,000, produced by land of small value for other forms of culture, while the yield for the whole of France is valued at well over a million pounds each year. The *Marron* is also found in several varieties bearing in most cases local names such as *Marron de Lyon*, or *Marron du Luc*, with fruit very large and of fine quality; *Marron de St. Tropez*, grown in the mountains of Var, and with a reputation second only to the

Marron de la Briga, a district upon the Italian frontier where quite the best fruits are grown. Other named sorts are *Numbo*, a hardy and fertile tree, early and with good fruits ripening in September; *Paragon*, fertile, fruit large and of good quality; *Les Huminaux*, *La Matronne*, and *La Corrive*. Beside these kinds grown for their fruits there are a few garden forms distinguished by differences in their habit and leaf-form, some of which are distinct, and several worthless variegated sorts.

CULTURE.—The fruiting Chestnuts grown for fruit are raised from seed, the young plants being grafted when three to four years old and planted finally when 6 to 8 feet high. As with all deciduous trees, this must be done in late autumn or winter. Beyond what is necessary pruning is unfavourable and trees grown for fruit must have a warm and sheltered position or the nuts will fail to ripen; this they do, according to climate and variety, from September to November, falling to the ground, where they are gathered up, stripped of the shell, and laid in an open shed to dry and mature, turning them from time to time. The choice fruits are often dried upon trays placed in the sun and housed at night, or even in special ovens for the purpose. A fertile full-grown tree will produce a hundredweight of nuts in a good season, but it does not reach such a size under fifty years, though plants frequently bear at ten to fifteen years if from suckers, and fifteen to twenty from the graft. Its growth in England is yet slower, and, save on warm soils, its fruit too often fails to ripen well. When mature the trunk is

very apt to decay, particularly in heavy soils, but, like the Willow, the tree may last for many years even after this has taken place.

ENEMIES.—The Chestnut is unhappily exposed to the attack of quite an army of enemies, insect and otherwise, though fortunately the greater number of these are unknown to this country. The leaves are sometimes injured by a fungoid parasite appearing in minute black spots upon their surface and causing their premature fall; but the most threatening danger is due to a mysterious root-decay known as “Ink, or Black Foot,” set up by causes as yet unexplained. Appearing in Brittany some half-century ago, it has slowly spread until it now causes loss in all parts, including the Azores in mid-ocean. The cause of the disease seems to be a root-parasite, whose presence transforms the sap into a corrupt black fluid, and as the enemy gains ground the tree perishes, sometimes with startling suddenness. Serious loss is already due to this cause, and until the pest is itself known there seems small hope of cure; up to the present all efforts have failed to fix its precise nature.

SIMPLICITY OF PLAN IN SMALL GARDENS.—Our suburban gardeners in London wind about their little bit of gravel walk and grass plot in ridiculous imitation of an ugly big garden of the landscape-gardening style, and then with a strange perversity fill up the spaces with the most formal plants they can get; whereas the merest common-sense should have taught them to lay out their morsel of ground in the simplest way, to fence it as orderly as might be, one part from the other—if it be big enough for that—and the whole from the road, and then to fill up the flower-growing space with things that are free and interesting in their growth, leaving Nature to do the desired complexity, which she will certainly not fail to do.—WILLIAM MORRIS.

NATIVE PLANTS IN THE AUTUMN GARDEN.

IN cold wet years our best flowers are often those of our own land. If our September weather was always fair, garden flowers would be very happy; but with the rains and storms now coming, bedding and other tender plants, and even hardy exotics, are soon spoiled. Then it is pleasant to see how some native plants are refreshed rather than disheartened by the rains, and come into welcome bloom. In many country places where there is room enough these take care of themselves; for instance, the Harebell and the purple Vetch (*V. cracca*) add much to the beauty of the autumn. Though the Heather may be very common in many districts, and its fine varieties may be planted, the less known Heaths, such as the Cornish Heath (*E. vagans*) and Dorset Heath (*E. ciliaris*), may be planted in rough places, and no plants are more deserving of it. The little Furze, too, which is so abundant in many upland wastes, is a pretty shrub, helping to form foregrounds to drives, and in low coverts just at this time blooming cheerfully and freely while other shrubs are past. As we write it is quite full of beautiful fresh blooms. It is easily raised from seed like the common Furze. Forget-me-not is still very pretty by water, and where the soil is rich the effect in broad fringes is very pretty. The berries of the Wild Roses begin to colour, and the various Blackberries also add to the beauty of the coverts and hedgerows. By the waterside, one of the handsomest bushes we have, the Water Elder, begins at this time to show the fine colour of its berries, and the Orpine on banks and the Golden Rods in the coverts also make a show. But we are not now thinking of wild flowers in their wilds but of such of them as are of effective garden use. The handsomest plant now in flower, and the most enduring in all this downpour, is the purple Loosestrife and the rosy form of it, 5 feet high round our ponds, growing in the moist banks and in the water, too. The French Willow (*Epilobium lancifolium*) is also good, also Codlings and Cream (*E. hirsutum*); this near water is very showy at present, and the blue Cornflower is pretty on banks above. Three kinds of bold grasses near water are in bloom, namely, the common Reed, the tall Manna-

Grass (*Glyceria aquatica*), and *Aira cæspitosa*. Nor must we forget the Catheads (*Typha*) of which two or three forms are stately on the margins of ponds. Another pretty plant is the common Flax (*Linaria vulgaris*), which is so happy on banks, and such a constant bloomer in late summer and autumn. Like the Welsh Poppy, it sometimes sows itself in borders, and is welcome.

PÆONIA LUTEA : WITH COLOURED PLATE FROM A DRAWING BY H. G. MOON.

THE Pæonies almost without exception have splendid colour, but yellow is an unusual hue, being found only in *P. Wittmanniana*, so that the present plant is a valuable gain. It is also exceptional in having woody stems, which are elsewhere found only in its near ally, *P. Moutan*, the well-known Tree Pæony. With this species it ought to cross, and, if some of the best forms of *P. Moutan* are selected, there can be no doubt of a good result. *P. lutea* is a native of Yunnan and was introduced by the Abbé Delavay, who sent seeds of it to the Jardin des Plantes of Paris, in 1887, where it first flowered in 1891. They were described on the packet as seeds of an Alpine plant, collected on the Ché-Té-Hotzé, above Tapintzé. Whether the plant is hardy or not does not appear yet to be known—so rare is it that experiments, no doubt, have been impossible. At Kew, in 1900, the first flowers produced in this country were obtained in the Temperate house. The plant was figured in *The Botanical Magazine* in the following year, fol. 7788. Like *P. Moutan*, it may be grafted, and apparently with very good result; for Monsieur L. Henry, writing in *Le Jardin* of the 20th of July,



PÆONIA LUTEA.

1897, of a particular specimen, says: "The abundance of its flowers seemed to us the result of grafting, because the ungrafted plants, though vigorous and of fine appearance, have given this year but one or two buds, which failed to open." The time of flowering in Paris, according to this account, is the beginning of June; at Kew the plant flowered about the middle of that month. *P. Moutan*, except in the milder parts of the country, is often cut down by frost, so that so rare a subject is best planted out in the border of a greenhouse, to which light and air have the fullest access. Here, with good management, it should succeed, though on the point of hardiness it may be mentioned that in Paris, planted out of doors under a bell glass, it came well through a winter. *P. lutea*, like *P. Moutan*, may be expected to do best in a good, rich, loamy soil.

R. IRWIN LYNCH,

Botanical Garden, Cambridge.

Pæonies and their culture have been so often dealt with that it seemed unnecessary to go further into the matter here; but, now, in connection with the introduction of this remarkable species, we thought it might be interesting to give a list of the species of Pæony already in cultivation in Britain (of which, perhaps, the best collection is that of

the Royal Botanic Gardens, Glasnevin), and for which we have to thank Mr. Moore. The garden varieties are numerous, and many are very beautiful.

PAEONY SPECIES AND VARIETIES GROWN AT THE ROYAL BOTANIC GARDENS, GLASNEVIN.

<i>P. albiflora</i>	<i>candida</i> .
" "	<i>fragrans</i> .
" "	<i>Humei</i> .
" "	<i>latifolia</i> .
" "	<i>major</i> .
" "	<i>Reevesii</i> .
" "	<i>rosea plena</i> .



PAEONIA LUTEA.

(Engraved for "Flora" from a photograph taken at Kew.)

<i>P. albiflora</i>	<i>tatarica</i> .
" "	<i>uniflora</i> .
" "	<i>vestalis</i> .
" "	<i>Whitleyi</i> .
" "	<i>anomala</i> .
" "	<i>hybrida</i> .
" "	<i>intermedia (Smontii)</i> .
" "	<i>tenuifolia-latifolia</i> .
" "	<i>arietina</i> .
" "	<i>Andersoni</i> .
" "	<i>Baxteri</i> .
" "	<i>cretica</i> .
" "	<i>oxoniensis</i> .
" "	<i>variety</i> .
" "	<i>Bakeri</i> .
" "	<i>Broteri</i> .

PÆONY SPECIES AND VARIETIES—*continued.*

- P. Brownii.*
 „ *coccinea.*
 „ *corallina.*
 „ *coriacea.*
 „ *daurica (triternata).*
 „ *decora.*
 „ „ *angustifolia.*
 „ „ *elatior.*
 „ „ *Pallasii.*
 „ *Emodi.*
 „ *humilis.*
 „ *lanceolata (Hort.).*
 „ *macrocarpa (Hort.).*
 „ *microcarpa.*
 „ *mollis.*
 „ *Moutan.*
 „ *obovata.*
 „ *officinalis alba.*
 „ „ *anemonæflora, single.*
 „ „ „ *plena.*
 „ „ *blanda.*
 „ „ *canescens.*
 „ „ *fine variety.*
 „ „ *lobata.*
 „ „ „ *Sunbeam.*
 „ „ *plena.*
 „ „ *rosea plena.*
 „ „ *Sabini.*
 „ *paradoxa.*
 „ „ *fimbriata.*
 „ *peregrina.*
 „ „ *byzantina.*
 „ „ *compacta.*
 „ „ *Grevillei.*
 „ *præcox (Hort.).*
 „ *pubens.*
 „ *Russi.*
 „ *sibirica.*
 „ *tenuifolia.*
 „ „ *fl. pl.*
 „ *villosa.*
 „ *Wittmanniana.*

PASSING through one of the most beautiful plantations of Pines we have seen in England lately, we were surprised to see the scene marred by wretched specimens of dying variegated conifers. Variegation in conifers is disease, and however freely they may be grown and pushed on in a nursery they die when planted out, and in dying disfigure all the ground about them. Why people go on planting them at a high price, giving them good positions that might be occupied by real trees, we cannot see.

HARDY PEA FLOWERS.

(Continued from page 202.)

The *Oxytropis* is among Alpine species the *ne plus ultra* of the order; but, unfortunately, these will not stand being moved; they appear to be difficult to raise from seed, and they certainly are very difficult to grow in any position I have ever been able to invent for them. The only species I ever succeeded in keeping at all was *O. campestris*, with dull straw-coloured flowers, common in the vicinity of Zermatt. This is dead now. Stagnant moisture, which they seem to find at once, is fatal to them, as it is to many other analogous species, such as some of the Alpine *Coronillas* and *Astragali*. Possibly a miniature “moraine,” composed entirely of gravel and sand with a little soil on top, might enable some of them to survive, but I have not yet tried this plan, though it has been suggested to me. The fault of the *Astragalus* is the weedy and aggressive habit of many of the species, of which there are vast numbers. Some few of them, however, make good garden plants. *A. monspessulanus* has died in this garden, as has also one of the best and most distinct of them, *A. adsurgens*, from Lake Baikal, probably from the same causes that kill the *Oxytropis*. I believe, too, I have lost the dwarf *A. hypoglottis albus*, a pretty and unaggressive little plant; and the only species at present on my rockeries, as well as I can recollect, are *A. alpinus*, an American species, strangely like *Vicia pyrenaica* and *A. ponticus*, recommended to me by a gardening acquaintance. This grows vigorously, but I have not yet seen it in flower. The tall-growing and quaint *A. alopecuroides* (or it may have been *A. narbonensis*) has died here. According to Grenier and Godron’s “Flore de France” this has only one habitat within the French limits, viz., Boscodon-près-d’Embrun, but it is seemingly found in the Alps, though, perhaps, only on the southern side of the watershed; at any rate, there is a specimen of it in the little botanic garden close to the English church at Zermatt, which is, I believe, supposed to illustrate more or less exclusively the flora of the neighbourhood. A somewhat uncommon species is *A. tragacantha* (the Goat’s Thorn), a dwarf, almost evergreen bush, which grows slowly. It has never flowered here. This is indigenous to the

Mediterranean littoral, and is found in several places on the south coast of France. People with large gardens and rough places in the form of banks or rockeries to cover may do worse than introduce the British plant *A. glycyphyllus*. The flowers are of a greenish white and quite inconspicuous, but the leaves are rich and beautiful, greatly resembling the *Acacia*. *A. glycyphyllus* is, I believe, widely and generally distributed as regards its habitats in this island, but it is not common, and comparatively few people know it. I have found it in Kent both on the chalk and more plentifully on the ragstone.

Coronilla iberica is one of the most beautiful and floriferous of dwarf Alpines, and *C. varia* (also a good plant for a rough bank) is one of the most aggressively weedy. The latter is abundant in places on the banks of the lower Rhine as well as on the Alps. The dwarf *C. minima*, and also *C. montana*, are both said to be good, but I have never grown either.

Probably the *Hedysarum* now commonest in gardens is the Mongolian *H. multijugum*, a beautiful shrub which merits a good place and good cultivation. It is generally said to grow between 2 and 3 feet high, but the fine specimen on the top of the rockery at the Cambridge Botanic Garden must be close on 5 feet high and as much through. The best known Alpine form, *H. obscurum*, is growing here, I believe, as is also a richer-coloured form known as *H. neglectum*. *H. boreale* I never could get to grow. I was under the impression (probably picked up at school) that the Latin word *flavescens* meant yellowish or inclining to yellow. The true meaning of the word, however, is apparently purplish or inclining to purple—at any rate, that is, or was, the colour of a plant I bought some years ago under that name, but which, for reasons of its own, gave up flowering and is now dead.

Anthyllis montana and its variety *rubra* are two beautiful plants, and suitable for good places among choice flowers. There is a small Alpine shrub, *A. barba Jovis*, which I have grown here for the last year, it has good foliage and white flowers, and is very distinct. The common Lady's Fingers (*A. vulneraria*) is a beautiful plant in growth, having entire leaves of a peculiarly rich glassy green, though the yellow flowers are of little value. The pale

straw-coloured variety, found sparingly at the Lizard, is common in Switzerland, but, though I have once or twice paid for it, I have never yet succeeded in getting the var. *rubra*, which is probably rare even in its own habitat.

Ononis rotundifolia is a beautiful Rest-harrow, which, in spite of its sub-shrubby habit, I have found at high altitudes on the Alps. I can never keep it for more than two or three years at the outside, nor can I get seedlings spontaneously from the parent plant. *O. fruticosa*, also with pink flowers, is an Alpine shrub of quite exceptional beauty, which is much to be recommended. There is a species with yellow flowers, which I saw on the rockery at Kew a year or two since, that struck me as decidedly distinct and desirable. I fancy I have been told by some nurseryman that this is not hardy, but I do not quite see why it should not be, for, though it bears the name *O. arragonensis*, it is found on the high Pyrenees "au Port de Bénasque," according to Grenier and Godron. *O. natrix*, a plant to which Pliny seems to have stood godfather, is also pretty, with flowers of a rich, though not, perhaps, a very refined shade of yellow. The plant appears to be somewhat local in Switzerland. Where it grows, as it does in the Val d'Herens, below Evolena, it is extremely abundant, but you may walk whole days in other valleys not far off and never see a sign of it. It has never proved lasting here.

Tetragonolobus siliquosus (a truly appalling name) is a pretty little Alpine, with pale yellow flowers, borne singly. It seeds about a little, being, along with *Orobis roseus* and *O. luteus*, the only Alpine Leguminosa which spontaneously produces seedlings here. The native Horseshoe Vetch (*Hippocrepis comosa*) is one of the best of yellow rock plants.

One of the most beautiful of the family in cultivation is the Himalayan Blue Clover (*Parochætus communis*); this, however, is not hardy in most gardens, though I believe I kept it more than one season, even in this cold soil and climate, when it was first given me many years ago. It is not to be relied on, however; moreover, it blooms in the autumn, which I do not consider an advantage, though others may.

Vicia pyrenaica is a pretty plant, with a somewhat aggressive and weedy habit, and

should not be admitted among choice Alpines. The Phacas, although Alpine plants, are seldom seen in gardens, nor does seed, which I have occasionally gathered and brought home, appear to germinate readily. *Tephrosia virginica* bloomed here once and then died; it was of no value, and I cannot even remember what it was like. *Tephrosia* is allied to *Galega*, and almost all the species want greenhouse or stove treatment. The *Petalostemons* are other plants of this order which are sometimes offered, but I have never seen them.

Of the remaining species of hardy Leguminosæ, *Onobrychis* (the Sainfoins) contribute, I fancy, nothing to the garden; and, with regard to the Medicks (*Medicago*), I see it stated in "The English Flower Garden" that there are only two species fit even for rough places. From what I know of the general appearance of these plants, I conceive this to be entirely true; but, on the other hand, many years ago I saw at Kew a plant with something the habit of, but even more neat and floriferous than, *Coronilla iberica*, labelled *Medicago marina*. Someone has blundered; but on this occasion I should be disposed to back the book against the label.

I wrote this last paragraph some four or five years ago, and I let it stand now in the hope that someone among the readers of *FLORA* will be not only able, but willing, to throw a little light upon this plant, for, as a matter of fact, I am now disposed to take the label as against the book. When these notes appeared in *The Garden* they gave rise to some discussion, and I recollect that someone wrote and stated with the confidence of personal knowledge, that the label and not the book was the true Simon Pure. I recollect also writing to ask for a little further information as to this plant, but I do *not* recollect getting any. It is certainly at once remarkable and regrettable that so exceptionally a good rock-plant should have altogether disappeared from cultivation. *O. marina* is found both on the south and the west coasts of France.

J. C. L.

SYMMETRY certainly owed its origin to vanity and indolence; to vanity, in attempting to force the situation to accord with the building, instead of making the building suit the situation; to idleness, because it was more easy to work upon paper, which will allow of any form, than to examine and combine the real objects.

—MARQUIS DE GERARDIN.

GROUPING AND MASSING HARDY PLANTS FOR EFFECT.

IN most gardens of any size there are portions which from various causes, such as shortness of labour, distance, or other inconvenience, are a worry to the gardener and a perplexity to his employer. It is becoming more and more the practice to treat such tracts as Wild Gardens; and often a better plan could hardly be adopted, suiting as it does by its wide range of treatment all manner of soils and conditions. It may be "wild" indeed—through the use of native plants, or "wild" only as regards their manner of grouping and general treatment; in fact, the Wild Garden is fast becoming so much in use that some people are prone to regard it as almost the one aim of garden art, and are at the same time making their wilderness as elaborate as any closely tended pleasure-garden could ever be. To call a garden of this kind "wild" is to mislead, for it is nothing more than a release from the old stiff primness of things and the exchange of one form of grouping for another—better and more beautiful it is true—but in no sense wild, while the elements that go to form it require the same care and attention as though planted in a border. The true idea is a collection of plants amid natural surroundings which will for the most part look after themselves, and require little care after planting. So planned and ordered the wild garden is not only a boon to many a hard-worked gardener but an added charm in gardens where the same spot was formerly little but a source of unsatisfactory expense. The moulding of a Wild Garden from ground previously untouched is not nearly so difficult a task as when the wildness already taken from it has to be restored. It then requires not only time and patience but far greater skill to call again into being the banished sense of natural beauty. Much may be done by scattering seeds, and Nature herself aids, but weeds always sprout more quickly than things of any value, so that one has to coax back by degrees the spirit of wild beauty, and meantime mould the loveliness that already exists in imagination. Not only is such work fascinating in detail but it is satisfactory from every point of view, whether artistic or utilitarian. It is real art; once laid down the garden is less costly to maintain, and has the charm of being always in

order and yet it is possible to work at it whenever one feels inclined, adding a touch here, a group of fresh plants there—a mossy stone found in some country ramble—or a scattering of new bulbs when autumn comes round. For dealing with the more distant parts of pleasure-gardens, for those of poor soil difficult to work, or where there is neither time or convenience for trim culture, there is no better system; in fact, with seasons so uncertain as ours it is the system best from every point of view. Of the bits of ground I have seen thus restored one of the most typical formed the half-wild approach to a house built on a lofty brow, too far from it to require the trim outline of the kept-garden, and yet in full view of all-comers. In the hill-side a quarry had been cut, and abandoned just long enough for Nature to heal the worst scars, and it formed when I saw it a beautiful sheltered dell. A good deal of rough work, breaking and bringing soil, draining, and carting, had to be done as a preliminary, a winding road made, and at the same time water was laid on, but all the wild growth of any value carefully retained. The whole was then carpeted with verdure of some sort; in damp corners sheets of Moss, of Creeping Jenny, and of White Cup Narcissus. In drier places broad irregular patches of Ivies (avoiding the heavier and more sombre varieties); of the variegated Dead Nettle (*Lamium maculatum*); or the Lesser Periwinkle, ranged in thousands, patches of the white kind relieving the sheets of blue. Grass was allowed between to vary and unite the whole, and only cut from time to time when too rank. This ground-work was broken by natural rocks where possible, or beautifully weathered fragments placed as carefully as any plant. It is surprising what art there is in choosing and so placing stones as to appear quite natural. The grouping of plants is a work of time, as ideas suggest themselves to the imagination, but it can be done at leisure when once the foundation is set. In the background, or to vary the low trailers, were dense clusters of such things as Solomon's Seal (*Polygonatum*), Foxgloves, Columbines, the Japanese Windflower (*Anemone japonica*), and in dry places clumps of Furze and Ling, with broad clusters of Heather—such as *Erica carnea*, *cinerea*, and *mediteranea*—in between. Touches of bright colour, according to season, were supplied by Honesty,

both dark purple and white, grown in masses in shady nooks; Campanulas in many sorts, and that little irrepressible *Corydalis lutea*, in the moister parts, with Brooms in variety, or scattered groups of Scarlet Geum put in around rocks for the high lights of the picture. The greater part of this background half-shaded from May onwards with stems of Bracken, sheltering thousands of Primroses, Hepaticas, Lily of the Valley, Grape Hyacinths, Snowdrops, and hardy Cyclamen—their beauty past, and grateful for the partial shade. The foreground was set with sheets of low-growing bulbs and perennials; here scattered thousands of the Spring Star Flower (*Triteleia*), or masses of Winter Aconite and the Siberian Scilla. As a succession to this early blue-flowered gem were masses of the deep blue Wood Hyacinth, and the delicate pale blue Italian Scilla. Very dry places round stones bore either Stonecrop, tufts of silvery Dianthus, or the Mourning Shamrock, the dark ruddy patches good in effect against the lichen-covered stones. In better soil *Oxalis floribunda* gave a spread of pink or white, or *O. Valdiviana* a copper-yellow hue. Here and there as though astray were hardy forms of the Thistle family, such as the blotched *Galactites*, the Fish-bone Thistle, and *Carlina acaulis*, and some of the Mulleins and Sea Hollies, their rosettes of foliage, grey, spiny, and bold, a good addition to the effect. Daffodils and Anemones of sorts each came in their turn, the Italian Windflower (*A. appennina*) telling in quantity whether blue or white, and the Scarlet Anemone useful at times for a glowing touch. Nor were the Iris forgotten, one of the dainty pictures in early spring being a clump of the Persian Iris, sheltered from frost by arching evergreens in a sunny corner shared with a colony of the Giant Scilla (*S. peruviana*), and the lovely Flowering Rush (*Aphyllanthes*). The list might be extended, but enough has been said to indicate the choice of easily grown plants at command, and each can vary and adapt it at will.

The routine work in such a garden is limited to the removal of things likely to be troublesome—harmless or good wild plants should be encouraged; watering during dry weather, best done—when water can be laid on—by placing a hose with spreader attached and changing its direction when things have had a good soaking;

and either grass-clipping or sweeping leaves according to season. Grass cutting, when necessary, should not be done by a machine, which leaves a harsh track and needs following with shears—a tedious process; even a scythe is clumsy. The best thing is one of the little sickles, light to handle and with an edge like a razor, common in Italy among the peasantry for cutting herbage. After a little practice a lad can do all that is needed quickly and without fatigue, and for clipping between plants there is no tool so handy. The autumn leaves may drift in amongst the evergreen foliage and should be left, all plants being the better for this natural food and shelter, and amid the stones and moss they are not unsightly. It is well not to dress with manure on turf if it can be avoided, for the grass gets the main benefit and grows so fast as to need extra clipping, which is not the result desired. The actual grouping becomes a pleasant pastime, but is not easy at first. Most people are so used to planting in lines, circles, and according to rule, that they find it difficult to form natural groups; and to some men anything like picturesque grouping seems impossible. The only way to learn the art is to study Nature herself and to notice the way in which colonies of plants spread and group themselves. For ages past Nature has been setting mankind her object-lessons in broad effects and natural grouping, year in and year out, with her sheets of Snowdrops, of Blue-bells, and Daffodils, her gold and purple decked commons, and woods of spring-tide snowdrift, summer garland, and autumn glow. Yet to many her teachings are just coming as something new. But that the day of truer ideals is once again dawning brings joy to those in touch with the living spirit of natural beauty. B.

THE CIDER ORCHARD AND THE BEST FRUITS FOR CIDER.

THERE is so much land in many parts of our country fitted for the growth of Cider-apples that there is reason for seeking progress in so pretty a form of culture. In Normandy, where the climate is more like our own, it is a very beautiful as well as profitable industry. A journey through Normandy in a good season can show us as pretty a sight as is anywhere visible in rural economy. The French, who make the

best wine in the world, think very highly of their Cider and make of it an important industry; not sour stuff, or over-sweet, unwholesome liquor, but a delicate and refreshing one. They have a fine climate for Grapes, which we have not, we have therefore the greater reason for attending to a fruit hardy in our country and as well fitted for our climate as for France. The beauty of fruit and flower of a Cider-orchard; improved methods of Cider-making, and a better knowledge of varieties and their value in every quality that concerns the grower, are all among the reasons which should lead to a more extended culture of the Cider-apple. With this preface we give the translation of a paper by Monsieur Ernest Baltet, which offers the best practical knowledge of French Cider-makers.

In early times Cider was made from the small apples found wild in woods and hedges and yielding a very acid and often bitter draught. By degrees the best of these wild or half-wild kinds were selected and improved by culture, and their own yield mixed with that of sweeter and more juicy sorts, by which the Cider not only gains in quality but also in keeping power. A good Cider should contain three main elements roughly proportioned as follows: sugar, four-tenths; alcohol, three-tenths; tannin, three-tenths. It should also be of a clear amber-yellow, pleasantly fragrant, showing body and a high specific gravity. No one of the many varieties of Apple now grown for Cider unites all these qualities, and hence the need of a skilful blending of good fruits. The great Cider-making districts of Brittany, Normandy, and Picardy have furnished a large choice of good kinds, of which we give those proved to be the best. As in the making of wine, it is important that the fruit used should be sound and ripe; we therefore classify our list of varieties according to their time of ripening, whether early, mid-season, or late. Though a number of varieties may be good for a large output, small producers of limited resources are wise to restrict themselves to sorts ripening at the same season to avoid the trouble and expense of separate brewings of small quantity. It is at the same time always a gain to grow several sorts ripening together, for not only does a blend produce the best results, but it also tends to equalise returns in view of untried conditions of weather, soil, and climate. The addi-

tion of about one-tenth of Pears in the whole mixture ensures a clearer liquid and is a gain in flavour.

FIRST OR EARLY SEASON.—Fruits ripening in early autumn and yielding a light Cider for immediate use only. APPLES: *Blanc-Mollet*, fruits sweetly-bitter and pulpy; *Docteur Blanche*, bitter; *Reine des hâtives*, sweet, fragrant, and pulpy, but not juicy; *Saint Laurent*, like the last but more highly coloured; *Secrétaire Pinel*, juicy, bitter, and acid; *Vagnon Le-grand*, sweetly-bitter, and highly coloured. PEARS: *De Croixmare*, good for Perry and for distilling; *De Navet*, sweet and very good.

SECOND OR MID-SEASON.—Fruits ripening in November and December and for general purposes the best. APPLES: *Amer-doux*, heavy cropper, bitter and sweet; *Amère de Berthecourt*, also a good bearer, well coloured; *Amère Gauthier*, very bitter, but prolific; *Argile grise*, juicy, sweet, and slightly bitter; *Barbarie*, bitter, acid, soft and pulpy; *Binet blanc*, slightly bitter and acid; *Binet gris*, soft and pulpy; *Bramtot*, soft, pulpy, slightly bitter, and of high specific gravity; *De Boutteville*, fragrant, highly coloured, and pulpy; *De Cat*, sweet and pulpy; *Doux Évêque*, sweet, slightly bitter and pulpy; *Goddard*, sweet and pulpy, fragrant and slightly bitter; *Jaunet de Gournay*, sweet and fragrant; *Martin Fessard*, late-blooming, bitter and pulpy; *Médaille d'Or*, heavy cropper, late blooming, very bitter, and of high specific gravity; *Petit Muscadet*, sweet, bitter, and fragrant; *Rouge Bruyère*, late bloomer, bitter, fragrant, and well coloured; *Vice-Président Héron*, sweet and acid, well coloured, fragrant, and of high specific gravity. PEARS: *De Crapaud*, sweet, excellent for Perry; *De Huchet*, fragrant, good for mixing; *De Souris*, fragrant, coloured, and reliable.

WINTER SEASON.—These include kinds ripening from the end of December throughout January. A good mixture from this series yields an excellent Cider, keeping well for years. APPLES: *Ambrette*, sweet, slightly bitter, and fragrant; *Bédan*, in several varieties, sweetly bitter, highly coloured, and pulpy; *Binet rouge*, sweet and pulpy, slightly bitter; *Constant Leseur*, sweet, bitter, and fragrant; *Doux-Geslin* or *Reine des pommes*, heavy cropper, sweetly bitter; *Fréquin*, also in several varieties, highly coloured, bitter and sweet; *Galopin*, sweet,

coloured, and pulpy; *Grise Dieppois*, sweet, pulpy, and of high specific gravity; *Groseiller*, sweet and fragrant; *Hauchecorne*, late, coloured, fragrant, and sweetly-bitter; *Michelin*, late, sweet, fragrant, and well coloured; *Or Milcent*, juicy, pulpy, and sweet; *Petite amère*, small, sweet, and bitter; *Pommate d'Avrolles*, late blooming, very sour, and slightly acid; *Railé rouge*, sweetly bitter; *Rouge Avenal*, sweet and pulpy, coloured, and fragrant; *Rousse Latour*, sweet and bitter, of high specific gravity; *Rousse verte*, heavy cropper, sweet, coloured, and fragrant. PEARS: *Cirole*, widely cultivated at Brie, sweet but acid; *Gros Carisi*, *Gros Sauger*, heavy bearer, juicy, and acid.

LATE SEASON.—APPLES: *Julien le Paulmier*, very late, sweet, bitter, and coloured; *Marabot*, sweet, coloured, and fragrant; *Marie Legrand*, late, sweet, bitter, and coloured; *Martin Onfrey*, *Ameret*, or *Roquet*, late and sweetly bitter; *Peau-de-Vache nouvelle*, bitter, sweet, and highly coloured; *Pomme à tannin*, very late, juicy, very bitter, and of high specific gravity. PEARS: *Catillac*, *de Livre*, large fruit, good either cooked or for Perry. These late kinds only ripen during the winter and when stored.

ROADSIDE FRUITS.—For planting along roadsides the following are recommended as being of naturally upright growth. APPLES: *Galopin*; *Grise Dieppois*; *Paradis*—a pretty fruit, red striped, without much juice, but sweet and pulpy; another kind, distinct though grown under the same name in the Limousin; *Président des Héberts*, bitter, and either mid-season or late; *Rouge de Trèves*, bitter and slightly acid, mid-season or late; *Vice-Président Héron*, already described. PEARS: *Eisgrüber Mostbirne*, early or mid-season; *Fraulerb*, blooms very late, small sweet fruits, early or mid-season; *Giroui* or *Daguenelle*, heavy cropper, juicy, acid, and early; *Gros Carisi* or *Gros Sauger*, mid or late season.

FRUITS FOR PRESS OR TABLE.—In this category are included varieties which, though not always of the highest quality for either purpose, can be used as required either for Cider or marketed for the table. Every country has a certain number of such kinds, and in Germany and Switzerland they are especially numerous. APPLES: *Belle des Buits* (*Pomme Pierre* in the Limousin), heavy cropper, sweet, fragrant, and late; *Borsdorf*, common in Germany, sweetly acid, mid-season; *Cardinal rouge*, grown in the

east of France, good cooker, mid-season ; *Carpentin*, common in the Rhine Provinces, sweet and fragrant, mid and late season ; *De Châtaigner*, widely grown, late in growth, pretty fruits, striped red, not juicy but sweet and excellent for preserving ; *De Flandre*, a late sort much grown ; *De Vigne*, large grower, fruit small and pleasantly acid ; *Des Vendues l'Évêque*, a late kind from Aube ; *Double bonne Ente* or *Double bon Pommier*, fine coloured fruits much in demand, mid or late season ; *Doux-blanc*, from Normandy, sweet and very fertile ; *Francau*, sweetly acid, good for all uses ; *Gelber Jacobs apfel*, from Thurgovia, good for kitchen and press ; *Gilet-rouge* of Brittany, late, sweetly acid, very good cooked ; *Golden Pippin*, well known in England ; *Gros Locard*, widely grown, vigorous and fertile, mid and late season, good for all uses ; *Luiken*, from Wurtemberg, late in growth, sweet, mid-season ; *Luxemburger Reinette*, late, excellent for kitchen and press ; *Nex-de-Chat*, heavy cropper, good quality, late season ; *Pomme Bouteille*, very vigorous, fruit oblong, sweet, mid-season and late ; *Reinette de Champagne*, widely grown, sweetly acid and fragrant, late ; *Rouge tardive de la Vallée*, very late ; *Schumacher apfel*, common in Switzerland, mid-season, striped red, and sweet ; *Vérène*, another Swiss kind, mid-season ; *Vérolot*, a very late sort both in growth and ripening, sweetly acid. PEARS : *Catillac*, *de Livre*, large and good when cooked ; *De Curé*, or *Belle de Berry*, growth very vigorous and fertile, fruit somewhat inferior, mid season.

KINDS GOOD FOR TABLE AND CIDER TOO.—The following kinds may be used for a light Cider which is agreeable but does not keep ; they are better in mixture with bitter sorts. Fruits of poor quality for the table may thus be sorted and turned to account provided they are sound. The list is arranged in order of maturity. *Gravenstein*, *Transparente de Croncels*, *Calville de Dantzick*, *Royale d'Angleterre*, *Queen of Reinettes*, *Cox's Orange Pippin*, *Ministre Viger*, *Doux d'Argent*, *Ribston Pippin*, *Canadian Reinette*, *Parker's Grey Pippin*, *Adams' Pearmain*, *Reinette de Cuzy*, *Boston Russet*, *Reinette de Caux*.

ERNEST BALTET.

Troyes.

FLOWERS in masses are mighty strong colour, and if not used with a great deal of caution are very destructive to pleasure in gardening. On the whole, I think

the best and safest plan is to mix up your flowers, and rather eschew great masses of colour—in combination, I mean. But there are some flowers—inventions of men, *i.e.* florists—which are bad colour altogether, and not to be used at all. Scarlet Geraniums, for instance, or the yellow *Calceolaria*, which, indeed, are not uncommonly grown together profusely, in order, I suppose, to show that even flowers can be thoroughly ugly.—WILLIAM MORRIS.

THE WATER-HYACINTH (*Eichhornia crassipes*).—This is one of the prettiest of water-plants outside the ranks of our Water Lilies ; it is not often seen in gardens, being supposed tender, but even in so cool a season as the present it is well seen at Gunnersbury House, where a mass of hundreds of these floating plants is now in full beauty in the open air, showing healthy leaves and many flower spikes. The leaves are handsome, round, fleshy, and glistening as though varnished light green, with their stems very thick and swollen, and so crowded with air-vessels that the plant floats easily on the water, from which the roots draw food, no soil being needed. The blossoms, borne in close-flowered spikes, are a pale violet, shaded either with pink or blue. The plant will not pass the winter in the open, but a small reserve, kept in a warm tank, spreads so fast in spring that by a careful division a stock is easily secured. It is a good house plant also, flowering freely in a bowl of water placed in a good light, and is then a pretty table plant. It is this plant which has become such a serious hindrance to shipping on the South American rivers.

BOOKS OF GARDEN CHATTER.—“ We are beginning to wonder how the woman who writes existed before the invention of the gardening book. To a certain extent she could vent herself in letters to her friends. But to the general public she was practically inarticulate. With the gardening book, in which the trivial round, the common task, served as pegs on which to hang spontaneous remarks about things in general, she became voluble ; and now we are wondering if she will ever stop.” Thus the *Pall Mall Gazette*, and with reason ; but, we ask, is it not the fault of editors and publishers that we have such a flood of this printed twaddle ? We think we have seen in the *P.M.G.* and other journals parts of these before they appeared in book form. A woman goes out into her backyard and talks to her ducks and reports the conversation as part of a book on gardening. A man sits down to write a book on the same theme and tells us that a wild goose has been seen to fly over his garden, but never known to alight therein, and so on. In other days some experience of the work, and knowledge, were thought necessary in a writer ; but that is all past, and people write now without anything to say or anything to teach, and the result is bookmaking in its worst form.

A MASSIVE PERGOLA.

ONE of the best changes made in gardens of our day is the use of the pergola with its various advantages. It gives us a most charming way of placing many climbing shrubs to the best

They have an idea that it is not a variable thing, but there is nothing that lends itself more to variety of size, and form, and material, than the pergola, from the fragile sticks that carry so gracefully the vines in Savoy, to the massive



A MASSIVE PERGOLA, WITH CIRCULAR BRICK SUPPORTS.

(Engraved for "Flora.")

advantage both for their growth and effect, inasmuch as we can see them in all ways, above and below. We have heard people urge that the pergola, like many other things made in gardens, should be mainly of one kind and size.

rough stone pillars of southern Italy. We have heard it said that in building a pergola it must be all on level ground, but we have made them on sloping ground with even better effect than on level ground. As regards size, we can adapt

them to the most fragile plants like the smaller Clematis, and where only narrow ways are wanted, or to bold airy structures fit to carry the greater hardy Vines and Wistarias like that we engrave here from a photograph taken in Mr. Edward Hudson's garden at Sonning. It is an example of a pergola on rising ground ; such massive timbers are only needed to carry the strongest climbing shrubs grown, and in places near the house where the element of endurance may not be lost sight of. For such a lasting pergola, to carry shrubs that live for many years such as those named, there is nothing better than a brick pillar. In this case they are rounded pillars, which require a specially made brick, though a brown "stock brick" would be quite as good, and much simpler in many situations.

LARGE - FLOWERING OUT-DOOR CHRYSANTHEMUMS AT EARLSWOOD NURSERIES.

DURING many years the great reproach against the Chrysanthemum was of being a plant from which good results could not be expected in the garden, and which needed a glass-house and heat to bring it to perfection; but this fault can no longer be found with the queen of autumn flowers. True, early flowering Chrysanthemums are no new thing, inasmuch that many years ago we had a few kinds so grown, such as *Madame Desgrange*, with its golden and primrose-yellow forms, *Mrs. J. R. Pitcher*, and a few others; but the choice was small, as were their flowers, and their merits insufficient to give them any great value for gardens. But that matters are now changed is seen in the display of large-flowered early-blooming Chrysanthemums grown by thousands in an open field by Mr. W. Wells, of Earlswood, Redhill. Their conditions of soil and culture are a convincing proof of their merit, for, far from being exceptionally well-placed, the ground is open and unprotected, low-lying and somewhat heavy, so much so that during the storms of this summer parts of it have been inches under water and quite unworkable. Yet spite of this year's trials the plants are in full beauty and form a sheet of colour which is quite a landmark beside the Brighton high-road, and a revelation to anyone unacquainted with the progress of the early Chrysanthemum, and the

new sorts raised by Mr. Goacher and distributed by Mr. Wells. Decided differences exist amongst the varieties as to habit, time of flowering, and resistance to bad weather, and it is upon these essential points that we have been at pains to get the latest information from the grower. Amongst the advantages of the early flowering sorts are that they brighten the garden far into the autumn, after other things are past their best, and the newer kinds maintain their display by shoots from the base until cut down by severe frost; in a mild autumn Mr. Wells has had many of these in bloom until near Christmas. The habit of the plants is, in the main, excellent—stout rigid stems and bushy habit, requiring little support from the stakes, which are such a care in the later-blooming section, while the variety of colour and form is well-nigh as great as in these. If rooted late and stopped once or twice they seldom exceed 3 feet, and most of them are not above half this height, while their freedom of flower is wonderful. We shall now give a list of the best kinds, seen in full beauty during the second week of September ; allowing for climate even north-country readers may plant the kinds named in confidence of a good result in early autumn, while those in milder districts may thus prolong outdoor beauty a long way towards the winter. Another point of value is that many of these plants can be moved with ease, without the bad results which follow in plants generally.

WHITE-FLOWERED KINDS.—These, being so much in demand, are much grown, and include some promising new kinds to be sent out next spring. *La Parisienne* is a new French flower of pleasing form, good size and habit, and stout stems. During fine weather, or as a pot-plant, it is very satisfactory, but as lacking in substance the blossoms do not stand rough weather as well as *Roi des Blancs*, another French kind which is robust (being rather taller than most), with long stems and a first-rate flower of large size and purity. If less free than some other kinds, when disbudded the fine blossoms make it a valuable kind wherever white is in demand, and flowers and foliage stand weather well. *Esperance*, though an attractive blossom with incurving petals, is not so useful a flower for growers, but *Champ de Neige* deserves great praise for its freedom and good form ; as a pot or border plant its dense bushy growth is ideal, and

the flowers, though too short in the stem to be good for cutting, are borne in profusion and show no trace of injury by weather. A fine English flower and one of Mr. Goacher's new kinds is *White Pet*, deserving equal honours with *Champ de Neige*, which it resembles in habit, but is a little longer in the stem; its blossoms are pure white, profuse, and of the size and form best adapted for wreaths and decorations in which long stems are not necessary. Of older sorts *Mytchett White* shows well as one of the best earlies and quite worthy of its reputation, but it has not as good stems as some of the newer varieties. *Parisiana*, which, though so different, is a sport from *Gustave Grunnerwald*, is also an early plant of great merit, grown in quantity for the continental markets under light shelters to prevent dewfall and splashing, a plan which Mr. Wells considers might well be followed more largely by English growers. *Charlie*, a flower of cream colour on opening, but becoming white, is free with blossoms prettily arranged, but as a border plant its habit is a little weak. *Cranford White* is a good plant of ideal habit, but the flowers are slightly tinted; while *Victor Mew* with quilled petals, a sport from *Madame Desgrange*, is distinct, but only an improvement when disbudded. We must not forget to mention *Mabel Goacher*, bearing a dainty single flower, useful for cutting and the earliest of the singles, often showing bloom in August. If Mr. Wells' hopes are justified we shall hear more of early-flowering singles.

PINK AND MAUVE-TINTED FLOWERS.—Mr. Wells is growing some new things in this class, where good kinds are scarcer than in whites and yellows. *Light Pink Parisiana* is a tinted sport from the white kind of that name, of which it has retained the habit, form, and other good qualities. Several of Mr. Goacher's strain show great improvement: *Belle de Septembre*, a rather tall grower, with long, wiry stems, flowers not large but very free, borne upon stalks of unequal length, which prevents crowding, while the petals are deeply coloured, especially towards their base, and the centre of the flower very distinct and pretty. *Pearlie*, a similar flower, but of a very beautiful rosy shade, which is rarely seen so clear and bright. *Blush Beauty* is a fine light flower of large size and the best of its colour, free, and of robust habit, resembling the old kind *Mrs. Pitcher* (the leaves of which had

suffered badly) but with a longer period of bloom, and better in flower and leaf. *Primrose* is a dainty pale yellow kind, of fine form and pretty as a spray. The older kinds of the *Masse* type, always cheerful and good in habit, were conspicuous for their show of bloom, *Madame Marie Masse* as a dense bush of lilac-mauve flowers about a foot high; *Crimson Marie Masse*, a bronze-coloured sport, just as good; and *Ralph Curtis*, a third variation, with petals just shaded mauve. *Madame C. Perrier* has flowers more deeply tinted, but this year is not a success, its foliage having suffered so badly as to spoil the beauty of the plant; it should not be planted in close order, and needs an open, sunny spot. *Edith Syrat*, with flowers of purplish-pink, was in good form, and *Mytchett Pink*, prettily flushed, very neat and profuse.

YELLOW FLOWERS.—Some first-rate new flowers appear in this group, the best of them being Mr. Goacher's seedlings. *Carrie*, grown in quantity, is in great demand for market; it is again of which Mr. Wells is justly proud, being very free, of good dwarf habit, lasting, perfect in form and colour, whether disbudded or in masses. For all round merit it is hard to choose between this and *The Champion*, a fine flower, rather bigger in growth and perhaps a little less free but renewing well, and so distinct that both may well be grown. A third, considered by the raiser as one of his best gains, is *Maggie*, a deep yellow flower, very double and of bushy habit, coming rather later, and as a good succession to those first named. *Leonard Peto*, a new sort sent out last season, has not done well; though good in colour the stems are weak and trailing, and the flowers show often a hollow centre. On the other hand, *Craigmillar* is of ideal habit, a dense bush covered with golden disks, rather small but in lasting profusion. As a border or pot plant it lifts well and is very neat. *Miss B. Miller* shows a large flower of intense colour, but the stems are a trifle weak for its size, though for large clusters a few drooping stems are not without their value. *Horace Martin* is a deep yellow sport from the *Masse* group, and shows their profusion, dwarf habit, vigour, and glowing colour. *Etienne Devillat* is a distinct flower of uncommon hues, being a blend of pale reddish copper and buff or chamois colour; the flower is to some tastes scanty, but the shades

are good in lamp-light, and many will be glad to grow it for vases.

ORANGE AND RED FLOWERS.—In this section *Goacher's Crimson*, the first great gain of that raiser, is still the best dark early, the flowers of a rich crimson, best in colour when not disbudded, but if thinned they are as much as 5 inches across; the plant is robust and of good habit, with flowers and leaves unharmed by weather. A second effective red is *Cactus*, of quite another type, smaller and less refined but good in colour, a profuse bloomer, showing well in sprays, and for some uses better than the more massive *Crimson*; for vases and dining-tables there is nothing better, showing well in artificial light and dainty in form. *Gladys Irene Harkness* is also a fine dark kind, very dwarf and showy for pots or the border, the flowers large and a good crimson, but too short in the stem to be popular for cutting. For this purpose one of the best is *Gertie*, a flower so hard cut as to be nearly over spite of its profuseness, but a second crop of blooms from below is coming fast; the flower is an uncommon blend of salmon-red and yellow, of ideal size for bunches, and habit of the best. A showy plant for the border is *Mrs. A. Willis*, a sport from *Madame C. Perrier*, but better in habit and leaf, coming in low, dense bushes with flowers so free as to hide the plant; they are bright crimson and gold on first opening, but pale to a warm terra-cotta in sunlight. *Rosie* shows this terra-cotta colour to perfection, being finest when full-blown and lasting a long while; the disbudded flower comes large, fully 4 inches across, left to itself it is a mass of blossoms on bushes of dwarf habit, making it effective for beds or massing; it is a little later in flower than some. Of orange flowers there are two good kinds in *Orange* (one of the new gains), a large flower of fine form and colour and very distinct; and *Pollie*, a good early and renewing well either large or in sprays; in this colour these two kinds leave little to be desired. An older sort, *Madame Zephir Lionnet*, with flowers of deep orange-yellow is also good, and *Vivid*, bright red with yellow reverse, is attractive, but a little late for cold districts.

POMPONS.—Though hardly coming under the heading of large flowers, many of these are so neat and showy, and need so little care, that for autumn borders they are a good class of plant.

As they move well, they can be grown on in any spare ground, and used to fill gaps as summer flowers fail, while a sheltered group of these hardy little bushes defy all weathers until sharp cold sets in. Amongst the best are *Anastasia*, light purple, very dwarf, and free; *Blushing Bride*, rosy lilac, and *Bronze Bride*, its sport, both large in growth and size of flower; *Flora* and *Golden Fleece*, rounded masses covered with golden flowers, the first opening quite early in August; *L'Ami Conderchet*, shapely little masses of primrose colour not above a foot in height, a gem for moving; *Little Bob*, early and free, uncommon in its crimson colour, but losing its richness in too strong a light; *Mignon*, a plant good in flower but sensitive to bad weather; *Mr. Selby*, with blush flowers, and *Mrs. E. Stacey*, a fine shaded yellow, leave nothing to be desired. Amongst Mr. Goacher's new seedlings is *Orange Pet*, a good Pompon of large size and distinct in its depth of colour.

On the vexed question of disbudding Mr. Wells admits that the best colour is shown by unthinned blooms, some kinds showing a marked change when disbudded, from pink to dirty white, or from bronze to a poor yellow. Where markets rule, however, large blooms, as commanding the best price, are most profitable.

TREE-FERNS.

THE Tree-fern is, perhaps, the most graceful of all types of vegetation, combining the stateliness of the Palm with the grace and luxuriance of the Fern-tribe, to which Nature has given a large share of these charms. A few well-grown Tree-ferns lend a peculiar grace to the glass-house or conservatory, breaking with their arching fronds the stiff outlines of the structure, casting a welcome half-shade during summer and still spreading their green canopy when outside things are shorn of beauty. True they need an amount of space which makes them of little use for any but lofty houses, but for winter-gardens and large conservatories such as are against many plants, there are few things their equal. The hardier kinds, too, may be well used out of doors from June to September, in quiet nooks sheltered from strong winds and fierce sunlight; a shady path winding through arches of Tree-fern being a lovely addition to any summer garden. There are a few favoured locali-

ties where they may even be grown in the open if the very hardest kinds such as *Dicksonia antarctica* and *Alsophila excelsa* are used. Though the dryness of the climate is rather against them, a few beautiful Fern-walks are to be found upon the Riviera and many fine individual specimens. It is usual to grow them sheltered from the sun under Palms and evergreen vegetation, but some of the best may be seen in full sunlight without seeming to suffer (save, perhaps, in length of frond) while they are far less liable to injury by frost or the rough dry winds which are their worst enemy. Tree-ferns are found in most parts of the tropics, Mexico, Brazil, the West Indies, India, the Cape, and Australia, but it is in moist insular regions such as many of the islands of the Southern Seas that they reach the greatest profusion. The isle of St. Helena is largely covered with fern-growths and Madeira is richly endowed, but it is in Tasmania, New Zealand, and the New Hebrides that they grow as forests of stately stems, rising from 10 to 40 feet and bearing a crown of drooping verdure—leaves 20 or more feet in length and gracefully pendant, sheltering a richly varied carpet of shade-loving plants. Such Fern-forests are found in sheltered glades amongst the mountains, where the atmosphere is constantly moist and equable, stretching it may be for miles under one vast dome of verdure, the stems ranged in endless vista, themselves daintily clothed with mosses and climbing plants, the whole with its dim religious light and the arching outlines overhead suggestive of some vast cathedral.

There is the shadow and the luxuriance of a tropical forest without its stagnant oppression—a constant ripple of light and shade—a quiver of the drooping fronds, and a stir and movement which dispel the gloom of denser growths. These Fern-glades are the last vestige of vast forests of Tree-ferns which the fossil remains of the coal-measures prove to have once existed over a great part of the globe, including our own islands and large tracts of the northern

hemisphere in which they are now unknown—Tree-ferns vaster and more luxuriant than any to be found to-day. By far the largest proportion of these fossils are Ferns, suggesting a flora approaching that of New Zealand, where, within a few acres, Hooker found thirty-six distinct kinds growing. Tree-ferns do best in a mixture of rough peat and light loam, for though when given a suitable atmosphere they seem largely indifferent as to soil, it is a mistake to suppose that they are in any sense *epiphytes*



—i.e., able to dispense with it. That they are imported without roots is due to the fact that in some of them a great amount of vitality is centred in the trunk, which with gentle heat and moisture ensures their growth after lying rootless and dormant for many weeks. In the same way old plants which have outgrown their limits may be topped and rooted again, but this must be done early in the year while the plants are at rest, and needs care in so planting that

the constant sprinkling needed may not do harm before the new roots start. If space can be given, Tree-ferns do best planted out, their growth being finer and more rapid; should they grow too fast for their quarters when fully developed, a yearly root-pruning in early spring acts as a harmless restraint, a circle being cut with a sharp spade some 30 inches or so from the stem. If kept constantly and evenly moist many kinds will stand without injury far more sunlight than is usually allowed, but if the stems dry the fronds suffer. To guard against searching winds is the main care in their use for gardens; it is well not to put them out till the new growths are fairly hardened. While active, a little weak liquid manure will do no harm, and give a richer green to the foliage; a mixture of soot-water and diluted blood is often so used in the south of France. Where the naked stems are an objection nothing is easier than to clothe them with certain of the climbing Asparagus, or such Ferns as Lygodium, Davallias, or Polypodiums. A large choice may be grown under glass, but as being the best for all uses we mention only the hardiest kinds in each group.

Alsophila australis.—A noble plant and one of the best known, showing a straight and slender trunk 15 to 20 feet in height and gracefully proportioned. The thrice-divided leaves are of a leathery texture and 12 or even 15 feet in length, light green above and slightly glaucous beneath, the leaf-stalk and mid-rib rough and covered at first with dark scales. It makes a beautiful object in the garden during summer, its leaves being less liable to injury than those of some Tree-ferns, while there is something majestic in the way the great fronds come rolling out from the centre. It should not be exposed too late in autumn; even on the Riviera its fronds are often destroyed by frost though the stem remains uninjured. Tasmania and the mountains of Southern Australia.

A. Colensoi.—A small growing kind with a stem of only 4 or 5 feet and leaves short in proportion. A cool-house plant from the hill-country of New Zealand.

A. Cooperi.—A fine greenhouse variety, easily known by its very straight and slender stem, devoid of aerial roots. The thrice-divided leaves are bright green, their ribs densely clothed with scales. Queensland.

A. excelsa.—A large and vigorous kind nearly hardy in mild western districts. It is a rapid grower, quickly developing a trunk, which in its native haunts reaches a height of upwards of 60 feet. Its fronds are broad and very light in appearance despite their size. Young plants are readily raised from fertile spores and grown into useful size for market, the garden, or the house. Norfolk Island.

A. frigida.—A rare but very hardy kind found at a great elevation in the Andes; small, with a short stem, leathery leaves, and woolly leaf-stalks.

A. Leichardtiana.—A plant akin to *australis* and one of the noblest of the group of "grove-loving" Tree-ferns. Its stem is slender, 20 to 30 feet in height, bearing a luxuriant crown of fronds, gracefully arching, and some 8 to 10 feet long, dark green above, lighter beneath, firm in texture and smooth on the ribs. The leaf-stalk is of a dark purplish black, spiny and powdered when young. Fine specimens of this splendid plant are to be seen in gardens on the Riviera, some of them nearly 20 feet in height and doing well in full exposure.

A. Loddigesii.—A handsome localised kind from New South Wales, and like *australis*, save in its shorter fronds, broader leaflets, and some other botanical details.

A. lunulata.—A very variable species from the South Sea Islands. Reaches at maturity 20 to 25 feet, and is found in several distinct forms.

A. pruinata.—A distinct kind, which, though very rare, is found to succeed well either in stove or greenhouse; conspicuous for its graceful habit and the silvery under-surface of its fronds, which make it a beautiful and easily-known kind. The stem not infrequently breaks into several heads, making division an easy matter. Tropical America and the West Indies.

A. Rebeccæ.—A plant of marked habit, bearing short fronds on a low, smooth trunk; the leaves very graceful, firm, and tough in texture. Queensland.

A. Scottiana.—From the eastern Himalayan region; a plant with large, thrice-divided fronds and smooth tissues. In addition to the foregoing there are several greenhouse species imperfectly known, but from their native haunts (often at a considerable altitude) in

Queensland, China, Sikkim, Brazil, and South America, they should prove fully as hardy as any of those in cultivation.

Cyathea Cunninghami.—A beautiful Tree-fern from New Zealand, of slow growth and small dimensions. Though less imposing than its congeners its tough leaves make it a useful plant for the sheltered garden in summer.

C. dealbata.—A remarkable kind, sometimes in its wild state reaching a great height, but under culture seldom more than 15 feet. Its leaves are about 7 feet long, glaucous green above and silvery white beneath, divided into narrow leaflets, with stalks and mid-ribs covered with brown scales or a pale down, according to age. This makes a beautiful object in any collection of Ferns, with its black stem forming a striking contrast to the pale foliage. Like other Tree-ferns, *Cyatheas* need copious waterings upon the stem and at the root; otherwise their culture is of the simplest. Where plants can be spared for the garden the beauty of this kind is singularly striking in contrast with the green-leaved sorts, while if properly hardened off and watered they will stand a good deal of sunlight. New Zealand.

C. medullaris.—One of the largest and most imposing of Tree-ferns, also a native of New Zealand, where it is found with a trunk reaching 40 or more feet in height, bearing a crown of spreading fronds at times as much as 15 feet long. The strong bright-green leaves are borne on stalks which, when mature, are smooth and glistening, and of a deep black colour. Where space can be given to it there are few better kinds for all-round use, but being of very rapid growth it must have room to develop. Its specific name is due to the fact that its pithy heart-tissues consist of a farinaceous substance resembling sago, and used for food by the South Sea Islanders. New Zealand, Norfolk Island, and the Isles of the Pacific.

If somewhat less graceful in outline than the *Alsophilas* and *Cyatheas* the *Dicksonias* are very beautiful in leaf, and being far hardier are of greater value for gardens. The best known kind is hardy in many of the milder parts of the south and west where fine specimens may be seen in the open air. Their trunks are stout and well developed, usually straight, but sometimes arching or branched, and often enlarged towards the base by masses

of aerial root. While this mass of root-tissue gives them a greater endurance than many Tree-ferns, they are easily injured by drought, so that plants which are imperfectly watered never fail to betray it in their fronds; it is not uncommon to see the leaves stunted or withered on an exposed side from this cause. To avoid this the old leaves are sometimes allowed to hang and accumulate round the stem as in a state of nature; this gives protection, but it spoils the look of the plant. *Dicksonias* do best in shade, their native haunts being deep ravines shut in by mountain ridges in Tasmania and New Zealand. The following are the cool-grown species of *Dicksonia*:—

D. antarctica.—The commonest and the best of Tree-ferns, a rapid grower, of easy culture, bearing sometimes as many as fifty fronds, often of great length, on a stout trunk which at maturity reaches about 20 feet. The plant varies much in size of trunk, length of fronds, and droop of foliage. A group of *Dicksonias* in a sheltered dell is an unfailing source of pleasure and interest, and creates an effect of luxuriance and tropical grace unequalled, perhaps, by any other plant. They will stand a considerable degree of frost unharmed and suffer little from snow, but when planted in the open they must be watered without fail twice daily while in growth, and oftener during dry winds.

D. arborescens.—A rare species confined to one spot on the island of St. Helena, and remarkable as showing a branching trunk with often several heads of hairy fronds.

D. Barometz.—Another singular variation from the usual type, the hairy trunk being prostrate in this kind, whence its fantastic name of "vegetable lamb." Its fronds are long and graceful, tough, shining green above and with a glaucous under-surface. Assam, China, and the Malay Peninsula.

D. Berteroana.—A rare but handsome kind found only in the island of Juan Fernandez. Very robust and vigorous in growth, holding its bold foliage well from season to season; one of the best of the group.

D. chrysotricha.—Found in the mountains of Java: a good kind but very scarce in cultivation. Its trunk is less developed than in most of this family, with fragile surface-roots and a crown of twice-divided leaves borne with a peculiar droop.

D. fibrosa.—This rare plant owes its name to the dense coat of interlacing fibres netting the stout trunk; it bears short fronds with little stalk and of rigid habit. New Zealand.

D. Lathamii.—A plant of great interest apart from its beauty, as being the only known hybrid among Tree-ferns. It is a cross between *antarctic* and *arborescens*, and shows a blending of the character of these species. It is strong in growth, with leaves of 15 feet in length, the stems woolly or covered with reddish-brown scales. A noble plant for the Fernery.

D. squarrosa.—One of the slender-growing Dicksonias, its trunk slight and dark in colour, and often producing small side-shoots. The crown of fronds is peculiar in its flatness and in the dark stalks densely clothed with black hairs. New Zealand.

D. Youngiæ.—An uncommon plant of slender proportions, distinguished from *squarrosa* by its lighter colour; the fronds, of firm texture, are clothed with bright-tinted hairs and scales. Rare in collections. New South Wales.

There are but two or three kinds of Hemitelia which can do with cool culture, these plants being for the most part natives of the tropics and rare in collections. In character they are intermediate between Cyatheas and Alsophilas, many of them having at times been classed with one or other of these groups. They are vigorous growers, needing ample space, a fair amount of heat, and copious waterings, their fibres being in general drier than those of most Tree-ferns. The only greenhouse sorts are as follows:—

H. capensis.—A beautiful species, seldom reaching more than 10 to 12 feet of trunk, with a head of tender green fronds, 3 to 5 feet long and held somewhat erect. The fronds are less numerous than in many Tree-ferns, but bear around their base a mass of delicate filmy growth of dainty appearance, enveloping the crown and persisting after the fall of the leaves; this feature distinguishes it at once from other kinds. It has the habit, rare amongst Tree-ferns, of reproducing itself from side-shoots coming upon the trunk. Cape of Good Hope.

H. Lindigii.—A hardy kind found in the mountains of Columbia, near Bogata; its ample thrice-divided fronds are borne upon light yellow stalks, giving the plant a striking appearance.

H. Smithii.—This kind, often classed with the Cyatheas, is a native of New Zealand, found with a stem 15 or more feet in height and with fronds longer and more numerous than in *capensis*. They are light and graceful, densely clothed about the crown with hairs and down of a warm chestnut colour. A distinct and handsome plant, but its foliage is tender and sensitive to sunlight; it is thus less suited to open-air use than other cool-grown Fern-trees.

THE MERTENSIAS (*Smooth Lung-worts*) : WITH COLOURED PLATE FROM A DRAWING BY H. G. MOON.

WIDELY spread over the continents of North America, Europe, and temperate Asia, the extreme forms of *Mertensia* are very unlike each other. Till recently the genus was represented in gardens by four or five species from North America, of which the best known is perhaps the Virginian Cowslip; one kind from northern Asia, and our native "Oyster Plant." But within the last three years three or four other species, quite distinct in aspect and habit from those already known in gardens, have been introduced from the Himalayas, including the subject of our coloured portrait, a rare rock-plant which has never before flowered in Europe, and of which Mr. W. Irving of Kew gives us the following account. *Mertensia primuloides* is found from Cashmere northwards upon the southern and western slopes of the Himalayas, but always at a height of from 10,000 to 14,000 feet, above the tree limit and near that of perpetual snow. Here it may be seen growing in masses amid Mosses and dwarf alpine plants, including a white-flowered *Sedum*, the flowers of which are in fine contrast to the rich



MERTENSIA PRIMULOIDES

purple of the *Mertensia*. The seeds from which the plant at Kew was grown were collected in Hazara, a district in the extreme north-west of British India and at a height of 13,000 feet, and were distributed from Saharunpur in the year 1900. The plants so obtained flowered in the following spring, proving this to be a choice perennial for the rock garden, forming dense tufts of small elliptic leaves on long petioles, and spreading by creeping underground stems. The flowers are borne in dense racemes on leafy stems 4 to 6 inches high, their opening colour being a rich magenta-purple, passing with age through various shades ending in pale lilac-blue. The plant figured was in bloom during April and May, but in its native haunts its blooming season is much later in the year. It needs a well-drained soil, with protection from direct sunlight. Two other species of *Mertensia* from the Himalayas now grown are *M. elongata* and *M. echioides*; the latter plant, from Kashmir and western Thibet, is easily known by its erect corolla lobes and blue flowers. Yet others await introduction, no less than six kinds being described in the flora of British India.

None of the older kinds of Lungwort are common in gardens, though they are often refined and beautiful in form of foliage and habit, and graceful in the way their flowers are borne. They need a little care, but few plants are more worthy of it for those who have rock or marsh gardens, or even moist peaty or leafy borders. The best of these older kinds are the following:—

ALPINE LUNGWORT (*Mertensia alpina*).—A beautiful Alpine kind, which should only be

associated with the choicest rock-plants. The leaves are bluish-green; the stem is only 6 to 10 inches high, and has in spring or early summer one to three drooping terminal clusters of light, or at times dark, blue flowers. Rocky Mountains.

DAHURIAN LUNGWORT (*M. dahurica*).—Although very slender and liable to be broken by high winds, the plant is quite hardy, 6 to 12 inches high, with erect branching stems bearing in June panicles of handsome, drooping, bright azure-blue flowers. It is very pretty, and suited for the rock-garden or borders, and should be planted in a sheltered nook in a mixture of peat and loam. Division or seed.

OYSTER PLANT (*M. maritima*).—A beautiful native plant usually growing on the sea-shore. Should be given an open sandy soil, of good depth and sunny position. With its long stems of trailing habit, bearing blue flowers during July, it is a pretty plant for the rock garden, but is much loved by slugs. It should be tried on mounds of grit where it fails to do in rich soil.

BLUNT-LEAVED LUNGWORT (*M. oblongifolia*).—A dwarf species with stems but 6 to 9 inches high, bearing handsome clustered heads of bright blue flowers and deep green fleshy leaves.

SIBERIAN LUNGWORT (*M. sibirica*).—A tall kind, of delicate colour and grace of habit, flowering for a long period in moist garden soil. The small bell-shaped flowers are borne in drooping clusters upon gracefully arching stems 6 to 18 inches in height. Their colour ranges from a pale purple-blue to a rosy-pink in the young flowers; there is also a white-flowered form. An excellent plant for the marsh garden. Division. Siberia and North America.

VIRGINIAN COWSLIP (*M. virginica*).—The finest kind, bearing in early spring drooping clusters of lovely purple-blue flowers on stems 12 to 18 inches high; the leaves are large and of a bluish-green. In many gardens it never makes way; the finest specimens are grown in moist sandy peat, or rich leaf soil with shelter near. It is a charming old garden plant. The name was probably given by the early settlers of America, the graceful bearing of the plant no doubt reminding them of a very different British plant.

THE DISEASE OF CLEMATIS.

THOUGH the gardening press maintains a discreet silence upon this mysterious disease, it must not be supposed that its ravages have ceased. Let us hope, however, that this silence is neither that of resignation or despair, for, however difficult the plague may be to combat, these fine plants are worth fighting for. Many suggestions, mostly guesses, have been set forward as to the causes at work, one of the commonest, and, to my mind least grounded, being the attempt to trace connection between the presence of tiny worms upon the roots with the sudden destruction of the whole or part of the branches. It is well, before hazarding such theories, to try to locate the disease and fix its nature and effects. In my opinion it will prove to be of germ origin, for all the symptoms point to this. It is probably by slight wounds in the tender growths that the enemy makes its attack. After violent rains, during the damp heat of summer, and in low places where moist air remains stagnant, its ravages are most seen; on the other hand, few traces are found during dry weather, resulting either from heat or northerly winds, and it works little harm on breezy uplands, particularly if the soil is light and porous. Frequently, too, the disease comes as a sequel to the work of training and tying, especially when neglected plants have been disentangled and wounded. So much is this the case that many growers either leave the plants entirely alone, or follow their advance so closely as to allow of no such injury, and by these means escape loss. I have seen the phrase "Black Death," often applied to this disease, explained as due to the blackening of affected plants, but its author was plainly unaware that Clematis always blacken after death from whatever cause. This expression applies rather to the point first attacked, which is usually a narrow band, varying from a fraction to more than an inch wide, and generally just at the surface of the ground, though it may come a trifle higher or lower as the case may be. This diseased tissue is full of a black dust, but whether the cause or the result of decay is not clear, while of the stem little remains save the main fibres, which break at a touch, while the entire growth dries suddenly from this point upwards. A fact, how-

ever, of importance is that, not only are the tissues below the point of attack perfectly sound, but any stems not themselves attacked are equally healthy, and that, as frequently happens, new growth starting from below, providing it escapes contagion, is as sound and vigorous as that of any healthy subject. Under these circumstances one cannot well attribute to the roots a disease showing only on the branches, and which, when the roots are good, is repaired so naturally by sound tissue. Any-one may test the matter by an examination of the roots, when it will be found that if a certain number of plants show worms, a good proportion, particularly of the younger plants, are quite free from them, and yet the results are the same in both cases, the only thing proved being that, as might well be expected, the plants whose roots are most beset with worms recover but slowly. There are other interesting observations to be made upon this subject, such as the indemnity of the types, and of certain races, but for the moment my aim is rather to correct a mistaken theory, which by confusing issues might hinder the effective study and cure of the disease.—FRANÇOIS MOREL, in *The Revue Horticole*.

GUAVAS AND THEIR SUCCESSFUL CULTURE.

THOUGH closer relations with the West Indies tend to the increased use of tropical fruits, Guavas are as yet rarely seen in this country, and the trees themselves, though easier to grow than many fruits under glass, are only to be found here and there. A number of species exist scattered over the tropics of America and the West Indies, but of these only three or four have any great value, these being the Strawberry Guava (*Psidium Cattleianum*); the Apple Guava (*P. Guava*); its commoner form known as the Pear-shaped Guava (*P. pyriferum*); and the Gooseberry Guava (*P. pygmeum*), with a small but finely flavoured fruit. The two kinds most grown are the Strawberry and Pear-shaped Guavas, both of which are fruited in the open air upon sheltered walls on the Mediterranean coast between Hyères and San Remo, while quantities have of late years been planted in Algeria. With a little care heavy crops of fruit are secured each autumn, fruits equally good

raw or cooked, and ripening in long succession from October till early winter, few berries even on the same tree maturing at the same time, while their yield per acre is said to be greater than that of any other fruit.

The Strawberry Guava is best suited to our house-culture, doing well in any temperate-house or warm conservatory. Its roundish leathery leaves make it useful as an evergreen shrub, and with a little training handsome plants may be grown either from seeds (raised in gentle heat), layers, or cuttings. Layers of half-ripe wood root in a few weeks; older stems require as many months or even a year to become established. Cuttings of young shoots just getting firm, put in sand and placed in bottom-heat, are soon rooted, and when well tended will fruit in their second or third year; bushes less than a foot high are often loaded with berries. Though they lend themselves to any form of training, under glass they are mostly grown as standards, and such trees, whether in tubs or planted out, are good in flower to say nothing of their fruit. A mixture of sandy loam, leaf-soil, and decayed cow-manure suits them, the whole thoroughly porous and with abundant drainage; to ensure this lumps of rubble or charcoal are sometimes added to the compost.

On the Riviera the light granite soil of many parts, enriched with a little manure, suits them to perfection. They are there grown on terrace walls where the sloping ground prevents all risk of stagnant water; with the collar well raised they then risk nothing even from torrential rains. For the greenhouse they should be potted firmly and not over-potted, giving if necessary a second shift during summer rather than too much in spring. If old plants get at all pot-bound, weak liquid manure may be given while the fruit is forming. The small white flowers coming in May are numerous, slightly fragrant, and, like many of the Myrtles, not showy. During the flowering period the plants should be kept rather dry and air given freely when possible to aid in setting fruit. To get this of good size thinning must be done early, for crowded berries are small and tough; well thinned they should reach the size of a small plum, dropping off when quite ripe. They are then of a deep wine-red colour at the surface

and paler within, the flesh soft, of a fine flavour with abundant juice. The finest fruits may be used raw, sliced and sugared some hours beforehand, and eaten with cream; they are also excellent stewed or in pies, while Guava jelly deserves its fame as the richest known. Old trees reach 15 or 20 feet in height, but may be cut back when necessary; some of the best southern plantations are thus trimmed periodically, the finest fruit coming on fresh growths.



The Pear Guava is rather more delicate and needs stove heat. Its fruits are larger than those of the Strawberry Guava, very fragrant, and of fine flavour when fully ripe, but as they do not mature till late autumn the full aroma is difficult to secure in bad seasons. B.

A SPANISH GARDEN.—Embosomed in a valley and an unshorn forest, and refreshed by the Tagus and the Xarama which mingle their streams beneath the palace-walls, Aranjuez has long been the Tivoli or Windsor of the princes, and the Tempe of the poets of Castile. Even now, the traveller who comes weary and adust from brown La Mancha, and from the edge of the desert, looks down on the palace, sparkling with its long white arcades and gilded vanes amongst woods and waters, may share the raptures of Garcilasso and Calderon. The island garden, though deserted by royalty and grandeeship, has yet its bright sun and rivers, its marble statues and fountains half hid in thickets; the old Elms of Charles V.; and cathedral-walks of Hornbeam, peopled with a melodious multitude of nightingales. The fountain-pipes that once climbed unseen amongst the branches, and played from the tops of the trees, have long ceased to play; others, however, are still in full force; and a few camels, parading to and fro with garden burdens, preserve an oriental custom of the place, as old as the days of Philip II. Here Velasquez attended his master in his walks, or sat retired in "pleached bowers," noting the fine effects of summer sunlight and silvan shade, and making many sketches of sweet garden scenes.—*Annals of the Artists of Spain.*

YUCCA.

AMONG the many fine plants for which we are indebted to the flora of North America there are none more important for us than *Yucca*, commonly called "Adam's Needle." They present no difficulty of cultivation, are distinct in habit from other plants, and with their handsome forms they are one of our most precious garden possessions, though too often neglected or used in ineffective ways. They are the worst plants in the world to suit the dotting way of planting, that is, being stuck singly among shrubs; as in such conditions they do not get even the little sun we have, and we lose their beauty of form which is only to be seen well when they are grouped in picturesque, and in the best sense, natural ways. Few seem to recognise their fine flowering qualities; the larger kinds are not, perhaps, so regular in flowering, while the smaller kinds flower annually. We think, therefore, that they ought to be made a much more important feature in gardens generally. Apart from their flowering qualities they may be associated very well with our choicest hardy evergreens, and are excellent for dry ground, or hot banks, which so often occur in certain districts.

Those familiar with the Riviera are aware how much the *Yucca*—and its near ally *Cordyline*—contribute to the picturesque aspect of the gardens there. 'Tis a thing worth seeing, and too rarely seen by such as start away with the first hot days, to meet with a spreading mass of *Y. gloriosa* in full bloom, with perhaps a score of spikes each a yard in height laden with tinted blossoms; or *Y. au-*

stralis with its grotesque form, bearded leaves, and vast hanging panicle. Yet even there, where conditions are all in their favour, the plants rarely have a fair chance, nor are they used so much with an eye to their effect as to fill up some barren corner, impossible for anything less enduring. And there they are left to shift for themselves, the gardener rarely giving them a thought. Demanding little care, they get none at all, as a result becoming covered with scale, take on a hungry look, and are promptly cut down to start afresh; bold masses are thus few and far between. Some sorts, particularly the larger forms, to do well require more generous treatment than the dwarf kinds, but to form fine specimens must be watched, being apt to throw side-shoots, or suckers from the base, which if not removed confuse the outline and impoverish the loftier branches. However well tended they may be under glass, it is impossible to grow these forms with effect save as in a state of nature. *Y. elephantipes* with its huge swollen base, stout and knotted trunk and massive crown of vivid glossy green; *treculeana* with its majestic tuft of channelled leaves and tapering stem, in its smooth outline suggestive of the shaft of a lighthouse; or *australis* with its oddities of form, foliage, and flower.

Granted that the *Yucca* in these its noblest forms requires a better climate than ours, there are good kinds of tried hardiness, which are within the reach of every plant lover, not to mention new forms, hybrid and otherwise, deserving a trial. A short generation since who could have predicted the position that

the Bamboo has of late years claimed in our gardens? and, given a like care in the selection of sites and varieties, and some nursing until fairly established, there is reason to believe that our choice of Yuccas might also be considerably extended. Even at Kew, though Mr. Baker gives quite a list of hardy forms and species, there has been no attempt to group the Yucca, the few kinds to be seen being dotted here and there in the usual weak manner. The hardiest sorts are *flexilis*, *flaccida*, *filamentosa*, *glauca*, *gloriosa*, *Harrimaniae*, and that commonest of forms *recurvifolia*, and these are found in numerous varieties with a good range of form and habit. The variegated forms are dingy, less robust, and not worth growing, though good individual plants are sometimes met with. Exception may be made of the striped varieties of *aloifolia*, and that little gem *pendula aurea variegata* of Deleuil, which is quite a handsome foliage plant, but the red markings in some of the former are very inconstant and gradually disappear. *De Smetiana* also deserves mention; its arching purplish leaves and slender stems make it a most distinct plant.

Mons. Deleuil amongst his crosses has obtained some good varieties, including a handsome and free double-flowering sort, *Andreana*; a second, densely hairy; a third with grassy, silvery foliage, and other variations not yet seen in this country. On the occasion of our visit Mons. Deleuil was at some pains to explain his method of crossing, which it may be of interest to reproduce here. He insisted upon the great

importance of dry, bright weather for the operation, and was careful to remove from the inflorescence every flower not springing directly from the central stem, brushing the half-closed hand lightly over the selected flower-spikes as soon as the spores and ovaries appeared ripe. The resulting collection now includes some thousands of plants, the best being carefully propagated; and we would urge lovers of the Yucca to visit Hyères and study these new forms for themselves.

Mr. Carl Sprenger of Naples has also made the Yucca a speciality, and in view of their ease of importation and culture it is to be hoped that some of these new forms will be given a trial in this country. The great point to remember is, that the Yucca, to prove sturdy and bloom well, must have all the air and sun available in a dry and sheltered position—sheltered not by being half-buried amidst shrubs, but for choice grouped on a warm bank in the lee of a good wall or thick clump of evergreens.

A distinguished student of these plants has lately done us a great service; Professor William Trelease of the Missouri Botanical Garden, St. Louis, has given to the genus Yucca and its allies much thought, and the results have been published in the 13th Report of the Garden. With the best opportunities and a thorough devotion to the subject he has given us a precious account of the species and their relationships, of which, with his permission, we will make an abstract. Omitting his very complete lists of synonyms and other technical

matter, we think we shall render a service if simply giving a clear list of the kinds and their varieties. He prefaces his list of species with the following remarks :—

“This genus is the largest and most widely distributed of the group *Yuccæ*, extending southwards from the great bend of the Missouri river to the table-land north of the city of Mexico, and, after a break of unknown extent, into the centre of Central America and eastwards to the Atlantic, the Bermudas, and eastern Antilles. The capsular species are the prevalent northern form, and reach from Dakota to the Mexican state of Durango, and from the Atlantic to Nevada, with the exception of the Great Lake region, and that of the upper Mississippi and its eastern tributaries. The baccate species with papery core are of the southern Rocky Mountain and western region, reaching the Pacific in California, and the prevailing form of the Mexican table-lands. A single species with coreless fleshy fruit is restricted to the southern Atlantic coast of the United States, a small part of the Gulf coast, and some of the islands to the east, with a marked variety in the isolated peninsula of Yucatan; and a single species with similar foliage, but forming a core in the fruit, occurs in Central America, where its distribution is unknown (its real home appearing to be the mountains below Orizaba, Mexico. Several species and many varieties are known only in gardens, and two species are of local distribution on the south-eastern sea coast of the United States.”

Y. filamentosa (Linnæus).—Acaulescent, cespitosely suckering. Leaves firm, stiffly erect or spreading, about 18 inches long, usually something over 1 inch wide, narrowed above the base, attenuate or abruptly acute, occasionally somewhat pungent, green or a little glaucous, the back frequently roughened in lines; marginal threads rather thick and curly. Inflorescence 3 to 10 feet high, long-pedunculate, glabrous or very rarely puberulent. Flowers white, usually tinged with cream or green or rarely browned, expanding 2 to 3 inches; style white, elongated, at most slightly swollen, three-grooved. Capsule apple-green and with regularly convex carpels when maturing, 2 or $2\frac{1}{2}$ inches long and brown when ripe, seeds glossy. Coast plain of the south-eastern Atlantic region, from Florida to South Carolina, extending back to north-western Georgia, west-central North Carolina, Alabama, and the Gulf coast of Mississippi.

Varieties: *variegata*, leaves margined and striped with shades of white and yellow; a garden sport, the colour extremes of which deserve distinctive horticultural names: *patens*, leaves rather rigidly spreading, half to three-quarter inch wide, gradually attenuate to a sharp point; north-western to south-eastern Georgia: *bracteata*, very large with elongated leaves, the outer recurved, large foliaceous scape bracts, more frequently puberulent, panicle sometimes 15 feet high, and more attenuate petals. Capsule narrowly oblong, mucronate-beaked. About Charleston and adjacent Georgia coast, where sometimes seen in cultivation;—simulates in aspect or bract characters forms of *Y. flaccida*: *concava*, general characters of the type, but with very plicate abruptly acute or obtuse leaves, deeply concave and spathulately enlarged to a width of 4 inches;—Charleston to below Savannah, and intervening coast region: *media*, leaves thinner, the outer gradually more attenuate and recurved, the inner broadly lanceolate, the marginal threads straighter;—a garden form, passing towards *Y. flaccida glaucescens* and *Y. Louisianensis*, and probably hybridized with the former.

Y. flaccida (Haworth).—Acaulescent, cespitose. Leaves thin, flexible, the outer almost always recurved, half to 4 inches wide, elongated, lanceolate, very gradually long attenu-

ate, plicate, with fine, long, and rather straight, thin, marginal fibres except in some threadless garden forms. Panicle mostly pubescent. Maturing capsule dull greyish-green, carpels variously and irregularly flattened in places, as if shaved off with a knife; when ripe, broad, constricted and mostly flaring above: seeds dull, larger. North Carolina and Alabama in and near the mountains. Occasional simple racemes are produced from small lateral crowns, when the main crown is in bloom.

Varieties: *orchioides*, a garden form with stiffer, more erect, nearly threadless leaves, and racemose inflorescence: *glaucescens*, a more glaucous form with leaves mostly broader and erect until a later period, almost tomentose panicle, and more attenuate petals;—the common form of American gardens: *lineata*, a garden sport apparently of var. *glaucescens*, but in habit like *Y. filamentosa media*, having the young leaves striped with dingy white, soon fading for the most part. Doubtless it is this by which the variegated form of *Y. filamentosa* is often represented in gardens: *grandiflora*, a large glabrous form of var. *glaucescens*: *integra*, a narrow-leaved glabrous form of var. *exigua*: *exigua*, a garden form of *glaucescens*, but without marginal threads and possibly a cross of *recurvifolia*. These filiferous-leaved "bear grasses" of the south-eastern Atlantic States are not easily disposed of in an attempt to monograph the genus, partly because they are commoner in cultivation than wild, partly because of their inter-blending characters, and partly because of faulty earlier descriptions. One of this group (probably true *Y. filamentosa*) was introduced into Europe about 1675, and was one of the four Yuccas known to Linnæus a century later.

Y. tenuistyla (Trelease).—Acaulescent. Leaves rather soft, recurving, often a little scabrid on the back about 18 inches long and half to three-quarter inch wide, dark green, lanceolate, long attenuate, scarcely pungent, white-margined, finely filiferous. Inflorescence about 3 feet high, paniced at some distance above the leaves, glabrous or slightly puberulent. Flowers with narrower more pointed segments: style oblong, white, often deeply parted. Capsule stout, even: seeds glossy. South-eastern Texas, in part associated with *Y. arkansana*, which it closely resembles in foliage. These forms,

with *Y. Louisianensis*, comprise the grass-leaved Yuccas of eastern Texas.

Y. constricta (Buckley).—Low or acaulescent. Leaves rather rigidly divergent, about half an inch wide, whitish green, the white margin soon shredding into fine threads. Inflorescence 4 to 4½ feet, rather amply branched at top. Flowers white, globose-campanulate, with broad segments: style white, more or less tumid. Capsule constricted, flaring above, dark, with a ridge over each false septum. Seward County, Kansas, to the Pecos river region of Texas. I should say that this is quite distinct from both the preceding and the next species, differing from the former in its narrower, firmer leaves, and more ample inflorescence, and from the latter in its usually short stem, smaller capsules, and much smaller seeds.

Y. radiosa (Engelmann).—Caulescent, large trees reaching 15 to 20 feet, simple or with a few short branches at top. Leaves pallid, rigidly divergent, long, white margined and copiously filiferous. Inflorescence large, on a long exserted peduncle, glabrous. Flowers white, bell-shaped, with lanceolate attenuate segments: style white, oblong. Capsule oblong, smooth, not or rarely constricted, with ribless convex valves, straw coloured: seeds rather dull. Southern Arizona to the Rio Grande. As in *Y. glauca*, the fruit of this species is stout, oblong, and the seeds are exceptionally large. The leaves, usually about a quarter of an inch wide, vary from one-eighth to as much as half an inch, but broad and narrow-leaved trees occur in close association.

Y. angustissima (Engelmann).—Acaulescent, from thick horizontal root-stocks. Leaves one-tenth to quarter of an inch wide and 8 to 18 inches long, pungent, white bordered, and very freely filiferous below. The inflorescence glabrous, 3 to 4½ feet high, racemose or short-branched below. Perianth segments rather short, mostly acutely lanceolate. Capsule scarcely exceeding 2 inches in length, rough brown, constricted, with a median rib on each valve: seeds glossy. South-western Utah, south-eastern Nevada, and north-western Arizona, in the region of the Colorado river.

Y. Harrimanæ (Trelease).—Acaulescent, often cespitose. Leaves linear to spatulate-lanceolate, quarter to three-quarter or even

1½ inches wide, thin but firm, rigidly spreading, glaucous, or green with age, concave, pungent, narrowly brown-bordered with relatively coarse white fibres. Inflorescence 9 to 8 inches high, simple, flowering from close to the base, glabrous. Flowers greenish, large, with broad obtuse segments: style slender. Capsule brown, broadly oblong, about 1¼ inches long, constricted, flaring above, the valves sometimes attenuate-mucronate. Utah. A very distinct species, often flowering when the leaf-rosette is not over a span wide, the broadly spatulate foliage of these small plants being quite unlike that of any other mature *Yucca*.

Y. glauca (Nuttall).—Subacaulescent, or with branching prostrate stem. Leaves rather rigidly divergent, quarter to half inch wide, pallid, white-margined, soon finely but usually sparingly filiferous. Inflorescence 3 to 6 feet high, simple or with an occasional short included branch, floriferous from near the base, glabrous. Flowers greenish-white, globose or oblong, campanulate, the segments varying from broad and acute to longer and more attenuate; style green, tumid. Capsule large, oblong, usually not constricted, somewhat roughened, brown: seeds very glossy. Central south Dakota and southern Wyoming, to north-west Missouri, central Kansas and the vicinity of Santa Fé, New Mexico.

Varieties: *Y. g. stricta* (Sims).—The habit of the northern form of *Y. glauca*, but of more vigorous growth, and with longer, more erect stem. Leaves very long, half inch or less wide, at first somewhat glaucous, the entire white margin quickly shredding into slender fibres. Inflorescence usually tall, occasionally simple, but typically paniculately branched within or close to the cluster of leaves. Flowers greenish-white, often purple-tinted, varying from globose to oblong-campanulate, and with correspondingly short and blunt or acutely attenuate perianth segments: style greatly swollen at base, green. Capsule and seeds unknown. Seward County, Kansas, and doubtless elsewhere on the plains. *Y. stricta*, ever since its establishment, has been a puzzle to botanists, partly because no plant exactly corresponding with Sims' figure appears to have been found, and partly owing to confusion with a garden plant which would appear to be *Y. Louisianensis*. Although much collecting has been done in the South

Atlantic region since Sims' discovery of *stricta* no such near ally of the Rocky Mountain *Y. glauca* has been found in that region.

Y. Arkansana (Trelease).—Aspect and foliage of *Y. tenuistyla*. Inflorescence about three feet high, racemose or very rarely with a few branches, glabrous. Flowers with mostly greenish-white, broad, and obtuse segments: style green, usually very tumid below. Capsule little flaring, smooth: seeds dull. From Indian Territory and Arkansas to Texas.

(To be continued.)

F. LAW OLMSTEAD.

WE regret to hear from Boston of the death of one who was deservedly famous as a landscape gardener and did remarkably good work in true landscape-gardening—not the mean stereotyped plans such as disfigure the earth. He was not trained to the work in any office, and this was one secret of his success, but as a very young man he travelled on foot through England and much enjoyed the beauty of the country, and influences such as these shaped his life's work. He was born in Hartford, Connecticut, on April 22, 1822, and in 1851 made a trip to England which led to his first book, "Walks and Talks of an American Farmer in England." By this time, somewhat late in life, he had begun to give attention to landscape-gardening. He took a tour through the older States of the south, and wrote a series of letters which, when published in book form as "A Journey in the Seaboard Slave States," was recognised as the fairest description of the conditions surrounding slavery that had then appeared. This was followed by "A Journey through Texas" and "A Journey in the Back Country." In 1856, by a happy chance he met one of the commissioners of the new Central Park in New York, then just authorized by the Legislature. He was chosen superintendent, and in conjunction with Mr. Vaux proposed the plan which, in competition with more than thirty others, won the first prize. This was practically the first attempt in America to apply art to the improvement of a public park, and the work was done in such a satisfactory way that it was followed by plans for many other parks, and all of his work that we have seen is marked by a dignity and breadth of treatment as refreshing as it is rare.

FLORA

AND SYLVA.

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[Monthly.

A LAWN SPRING GARDEN.

SEPTEMBER 25TH.—I have just cut the second crop of grass from a lawn-like field stretching between the house and lake, and the weather looks as if I should be able to save it. Both hay crops were good, and beneath the mown grass lie half a million of bulbs of early flowers which will bloom in the spring. The grass does not interfere with them in the least, nor they with the grass, and by this I gain several things. *Firstly*, two crops of grass. To get this in the best state it is well not to leave the hay to get too old or straw-like, as is often done in England. *Secondly*, I get rid of mowing a large extent of ground (as was the custom, and is still, in many large places) and only mow the walks for play or use. I like to see flowers growing in the grass a great deal better than bare turf, and I avoid the expense of mowing. In such a space, where in some country places a heavy horse-moved mowing machine would be used, I do all the mowing that is wanted with a ball-bearing machine easily worked by one man. *Thirdly*, I get the most beautiful kind of spring garden possible to man, because my field looks like an Alpine

meadow with Crocus, Anemone, Grape Hyacinth, and Fritillary. I also put Narcissi there of the commoner and earliest kinds, but not those wanting time to develop their leaves. Such I put beside the ponds and in places where we do not mow, or mow only very late in the year to get rid of rough bents. There are few country places in which, in the woods, shrubberies, and on grassy slopes and rough places, there are not chances of planting the late-maturing bulbs and letting them ripen their leaves. In my lawn garden, which is mown in early summer, I prefer to use only the earliest flowers—Crocuses, Blue Anemones, Snowdrops, Snowflake, Star of Bethlehem, and things easily obtained, of quick increase, and flowering very freely; in fact, growing and beginning to mature their leaves before the grass starts to grow. They do this because they are mountain plants, and in their native countries are safe under snow until they flower, but in ours they open earlier. *Lastly*, and the greatest gain of all, I free my flower garden from the common-place, orthodox, though really puerile and stupid system, of rooting up and replanting the poor plants twice

a year. The main purport of this is said to be to enable one to put in spring garden-plants, mostly consisting of a few Forget-me-nots and ordinary spring flowers. If I get an infinitely more beautiful spring garden without this annual toil I may leave my flower garden alone in that respect and work for a real one, in which I need not disturb the inmates more than is necessary for their health. I mean one cannot have a garden of Tea Roses and Carnations, and the many beautiful permanent things, if one has to root up one's garden twice every year in order to stick in a few spring flowers in bad imitation of bedding out. I have had beds of Tea Roses in the same place for seven or even ten years in this enduring way of flower-gardening, but I also have the gain of being able to work at the beds all the winter to plant my new Roses, add choice perennials, protect things which a hard winter might injure, and surface the beds with small plants under the greater ones. And I am not excluded from a little choice spring garden, because, in the beds with Roses, Carnations, and other things best worthy of a real flower garden, I can put a layer of the more beautiful and rare bulbs which would not do so well in the grass, or would be too scarce to risk in that way. And, besides, I have but to look over the old terrace-wall from March to the end of May, to see a far finer spring garden in the turf than could ever be set out in the usual way. For years past many people, having got tired of bedding-out in their old flower gardens, and not knowing what to do, have turfed them up; thus we see flower

gardens attempted anywhere but in the right place. The old idea of a flower garden as a select spot near the house is the right one, be the soil what it may. The present way of scattering beds over lawns and kitchen gardens without plan or coherence, and even in woods and about pleasure grounds, is a weak and inartistic one, making up in no way for the loss of the real flower garden; this can never be made rightly without some permanent way of planting the beds.

* * *

FINE CAMELLIAS IN THE SOUTH-WEST.

THAT the Camellia is a plant needing glass shelter is an erroneous but too widely credited idea. The Camellia is a hardy shrub, and cases have occurred where the Cherry Laurel, the Portugal Laurel, and even the common Pontic Rhododendron have been injured by frost when a Camellia growing hard by has been unharmed. One reason of its hardiness is that it is slow to start into growth, while its leathery, glossy leaves withstand severe cold. Although it is in the south-west of England that the Camellia is to be seen at its best, its value as an open air shrub in Kent, Surrey, Hampshire, Sussex, Berkshire, Northamptonshire, and Middlesex is proved; it has even been known to thrive in the open 200 miles north of London. Very severe frosts have been known to split the main stems of large plants, causing death, but where the outer branches come down to the ground-level, as they do in well-grown isolated bushes in Devon and Cornwall, they effectually shield the main trunk. As the plant blooms in winter and early spring, when frosts and heavy rains are apt to mar the beauty of the flowers, the Camellia is not to be recommended for planting as a flowering shrub in exposed sites in bleak districts, for though its foliage may escape injury the blossoms are likely to suffer from the effects of rainy gales and frosts. Sheltered positions are therefore best in all but the warmest parts. The character of the soil, providing that it contains no lime, is of little importance, for examples are to be found of flourishing plants growing in

soils of very different nature. In South Devon and Cornwall the Camellia is seen at its best, and its flowering season extends over many months, some forms blossoming as early as November, while some are not bare of flowers before mid-July. In a letter from Cornwall written on August 10, a correspondent tells me that the latest Camellia was only just out of bloom. When in full flower the great bushes, often 10 feet or more in height and diameter, are a charming picture with branches drooping beneath their weight of bloom. I have counted as many as sixteen flowers on one small spray. All the old standard varieties of *C. japonica* are grown in Cornish gardens, many of which contain a large collection, none, however, equaling in number that of Lord Falmouth at Tregothnan, where there must be over 1,200 huge bushes in the open. The long back wall of the stables, some 20 feet high, is also covered throughout its length with trained trees. One white, cream-centred variety at Tregothnan has a sweet perfume. Most of these were planted about forty years ago. At Carclew there are numbers of fine specimens, the tallest of which must be nearly 18 feet high. The largest example I have heard of in the south-west, but which I have never seen, is growing at Tregrehan. It is a single form and was first planted in a greenhouse, but it became too large for its quarters and the house was pulled down. This bush is about 25 feet in height, its stem being over 3 feet in girth, and its age about ninety years. At Enys there are many large bushes, one of the most beautiful varieties being the shell-pink *Lady Emily Cathcart*. One of the most charming sights in the south-west in the spring is the long wall at Scorrier House, which is entirely covered with Camellias. The length of this wall is 244 yards, and the largest stem is $42\frac{1}{2}$ inches round. A species grown at Scorrier under the name of *C. myrtifolia*, bearing double flowers of a pale blush pink and with small leaves, is over 11 feet in height and $12\frac{1}{2}$ feet across; it is trained against a wall. *C. reticulata*, the queen of the race, is to be met with fairly often, but mostly as a wall shrub. At Scorrier, however, there is a fine bush of this standing in the open, 9 feet 2 inches in height, $8\frac{1}{2}$ feet in diameter, and $12\frac{1}{2}$ inches round the stem. At Saltram, Lord Morley's place in South Devon, there are many large bush speci-

mens of various varieties of *C. japonica*, and there are also two healthy plants of *C. reticulata* about 6 feet high. The Scorrier gardens also contain a large example of this kind trained against a wall. This is the plant that bears the flowers that invariably win the first prize for Camellia blooms at the Truro Daffodil Show. The semi-double blossoms of soft rose-pink, with their central cluster of golden stamens, are often over 6 inches across, and are very lovely both in colour and form, with none of the stiffness of the double Camellia. Plants of *C. japonica* and its more or less single forms often bear seed from which they have been propagated. The old single form strikes freely from cuttings, but the named double kinds do not root so readily. Cuttings are generally taken at the end of September and rooted in cold frames or under handlights; they are also sometimes taken in the late spring after some growth has been made. Cuttings strike well in pure granite sand, the white root-fibres soon running through it in every direction.

S. W. FITZHERBERT.

MAGNOLIAS AND CHOICER SHRUBS FOR THE HOUSE.

SOME few years ago I planted a little valley with Magnolias, as choice as to kind and strength perhaps as could be got in Europe, and did all that I could to make them at home. There was a screen of evergreen trees on the east side which ought to have helped them a little, but, in spite of all, our March winds and late frosts killed the flowers. In certain districts they might have escaped such an end, but the fact we have to count with is, that these shrubs flower sooner in our country than they would in their own, our mild green winters causing earlier growth than where the weather is more severe. On seeing my poor little *stellata* Magnolias marred by the blast it occurred to me that an excellent way might be to grow a number of these and like shrubs, so that they could be transferred to passages, halls, or even large windows, just as they come into flower, and that in this way we might enjoy their bloom no matter what the weather might be. I do not mean forcing of any kind, which would be quite needless for hardy shrubs, but simply protection from the ceaseless changes of our climate. The fashion of forcing shrubs is an

established one, and a very good one, but in the case of Magnolias and various of the more beautiful shrubs it is unnecessary. Sometimes in Paris one may see a Lilac in beautiful flower on a cold spring morning, in the window or passage of a small house, and on the Continent such plants are often grown for flowering in pots. Cultivation in pots tends to favour the blooming habit at the expense of size, which in this case we do not seek. A stock of such trees is to be had from nurserymen, but in many ways we may do a good deal ourselves to put this idea into practice. For example, in a group of shrubs grown in the open air we might have a few plants in wire cases or baskets, which could be shifted into vases just before flowering-time. Transference to a cool room or house and flowering therein would not in the least weaken them, and after flowering they could be put out again to take their place in the usual arrangements. The same plan might be carried out with hardy flowers. For instance, last December I noticed a number of Primroses struggling to flower in a moist wood, and taking them up I put them into flat basins with a few flakes of moss around them, gave them one gentle watering and put them in a cool window facing east. Months before the Primroses flowered in the open air these little dishes were beautiful. Many shrubs that are cut about by frost and storm are quite as hardy as the Primrose and treated in a like way would give us good results. I am quite sure that cultivating in this way our best hardy flowers and shrubs would add immensely to our enjoyment of their beauty. Those who had forcing and cool houses to spare could use them, but much could be done without anything of the kind, and whole classes of plants might be grown and enjoyed in this way which outside are failures in our climate, such as the double Peaches, which do very well in pots or vases. Plants that do well in our climate like hardy Azaleas, would be none the less welcome for their flowers, and in this way we could prolong their season. The recent additions of brilliantly coloured groups, the many forms of *Pyrus japonica*, Daphne, and the wondrous collection of Lilacs raised in France, make such a scheme all the more desirable; and some of our more popular evergreen flowering-shrubs, like Rhododendrons, lend themselves readily to gentle forcing.—R.

THE GREATER TREES OF THE NORTHERN FOREST: No. 8. THE MONTEREY PINE (*Pinus insignis*).

FROM its tenderness we should not have thought of including this Pine among the greater trees of the northern forest, for, coming as it does from one of the most genial of climates, it perishes in our lowland country in hard winters. On the other hand, in many parts of the south and west, or near our seashores, not very unlike those of its native habitat, it grows so well, and is so distinct in colour, that we include it in the interests of our own long-coasted country. Not only in Devon, Dorset, and the south and west, is it remarkable, but occasionally, here and there, we find fine specimens in the country round London, as at Blackdown, or wherever there is a sufficient elevation to keep it out of the way of the valley frosts. In Devon, at Bovey Tracey, Bickton, and many other places, its growth is very fine indeed, trees of 50 to 60 feet being not uncommon. It is one of the trees which in our vast shore regions may often be depended upon to form a shelter against the sea winds. In its native forests it grows rather closely together and the trees are clean of stem even up to a height of 60 or more feet; but in our own country, from being so often planted as a specimen standing alone, it is almost bushy in habit, and in this way loses a little in stature, at the same time becoming the more exposed to injury in snowstorms and heavy wet winds. The common idea that it is necessary that such trees should have a great open space to stand in is wrong

for the wellbeing of the tree, and wrong also even from the point of view of mere timber-growing. That Pines will only grow well if isolated like children lost in a desert, is a harmful delusion, though much propagated by books. Its evil results may be seen at Kew and every botanic or other garden in Britain, where the pernicious idea has been acted upon for years.

The Monterey Pine will grow freely in almost any well-drained loam, peaty, or stony soil, but that which suits it best is limestone, if free from stagnant moisture. It will thrive best if planted on the west sides of hills, and then it must be sheltered or nursed on north and east by other and hardier conifers. Being a native of the Californian coast, altitude is of less importance in our shorelands, but even there it should have shelter from cutting north and east winds, and certainly room for development. It frequently suffers from the attack of the Pine Beetle. This insect is readily detected by the young shoots drooping and suddenly falling off early in June, and if left alone it soon spoils the trees; each affected shoot should be cut off and burned. In planting this fine tree never plant from pots or large "specimens," but use small seedlings. Also, if the quickest and best results are to follow, plant like any

other forest tree, that is to say, about 5 feet apart, so that the young trees form a group and shelter one another; they can be thinned in due time. In that way not only is its quickest growth



THE MONTEREY PINE IN DEVON, SHOWING FORM OF ISOLATED TREE.

secured but we see its real value as a forest tree, or as a group for shelter near the sea. Dr. Henry, who has lately been in the south-west of Ireland, tells us of the fine way in which the Monterey Pine grows there, and also at Powerscourt, where there are fine trees of it.

THE BEST VARIETIES OF THE JAPAN QUINCE (*Cydonia japonica*).

ABSOLUTELY hardy and indifferent as to soil, the Japan *Pyrus* succeeds everywhere, whatever preference it shows being for a sunny spot. It forms in a short time spreading tufts of 3 to 4 feet in height, and in early spring is completely covered with flowers which vary from the purest white to the deepest crimson. The garden varieties of this beautiful plant are so little known that the following list of the sorts best in growth and colour may not be out of place. *Alba grandiflora*, a variety obtained in the Botanic Gardens of Paris, and the purest of the white-flowered kinds; *candidissima*, large flowers, lightly shaded with rose; *Moerlosii*, vigorous and free, with pale pink blossoms; *Mallardii*, rosy flowers tinged with white at the margin; *cardinalis*, large flowers of a bright scarlet; *atrococcinea*, free in its orange-scarlet flowers; *rubra grandiflora*, flowers of a rich crimson; *Simoni*, a recent gain, bearing large semi-double flowers of a dark crimson scarlet which is fine and distinct; and *Gaujardi*, with flowers of an uncommon salmon-red colour. Apart from these, there are other kinds not without merit, amongst which are *umbilicata*, of very strong growth, rapidly spreading into great tufts, and bearing fine rosy flowers; and *columbia*, remarkable for its large fruits, reaching as much as 8 to 10 inches round, and good for preserve.

They may be grown from seed, grafts, root-cuttings, or layers. Seed is little used except for raising new varieties. Grafting is not satisfactory, for the plants throw many suckers and the graft is short-lived. The best plants are grown on their own roots, and for this plan layers are preferable. At any time during winter selected branches are either slit with a knife, or partially strangled with a tight wire, and the wounded stem covered with soil for part of its length; without further care, by the following autumn sufficient root will have formed to enable the young plant to live alone. It is well in this way to replace grafted plants by layers on their own roots. Root-cuttings are only recommended where a quantity of young plants are needed. They should be taken in early spring from a plant known to be on its own roots, and which is cut back in proportion to the amount of root

removed. Sections are then made of the larger roots about an inch long, which are set in pans of light soil in a cold frame, and watered regularly. In a short time signs of growth are seen, and with ordinary care, two or three years in the nursery will ensure vigorous young plants for the garden. Once upon their own roots the tendency of the *Pyrus* to throw suckers need not be checked; indeed, the most beautiful bushes are those allowed to spread in their own way.

The writer of this note, M. Vivian Morrel (Lyon horticulteur), classes Maule's Quince (*Pyrus Maulei*) among the forms of *japonica*, but, since it is held as a distinct species at Kew, we follow their arrangement, though as closely allied to the Japanese Quince it is not out of place in this connection. It is less robust and smaller in all its parts, bearing flowers of a bright orange succeeded by small apple-like fruits, which in Japan are made into preserve. A fine variety, *atrosanguinea*, bears large flowers of a glowing crimson colour.

DEGRADING A BEAUTIFUL ART.—A London morning paper, the *Daily Express*, publishes the most hideous group of illustrations of "tree-carvings at Elvaston Castle." All who care for true and natural form will regret this prostitution of the name of Art. We read in the paper the following as regards the "artistes" who favour us with these monstrosities. The italics are ours:—

"Recently there has been a revival in topiary, owing to the desire on the part of American millionaires to purchase clipped trees and transport them to the States regardless of cost, in order to give their gardens the appearance of antiquity. Clipped trees demand constant attention. If left alone for a week they begin to look ragged, and in a month they would be almost ruined. Only a highly-skilled man can do this work, as an incompetent tree-sculptor can utterly ruin a magnificent sun-dial or peacock with a few clips of his shears. A tree-sculptor cannot make mistakes. He must be absolutely sure of each stroke. For this reason it is said that such an 'artist' is born and not made, for he cannot acquire proficiency through practice on trees of this kind. The effect, however, is well worth the trouble taken. No one who has seen the wonderful gardens at Elvaston Castle will ever forget the sight. Some of the designs are almost startling, and all of them are *remarkably true to life*. At Elvaston several tree-artists are kept constantly employed at clipping, and the remuneration earned by these men is very high."

THE NEW CACTUS DAHLIAS ON THEIR MERITS.

FOR those who aim at garden beauty the show is no test of merit, as throwing no light upon many points of importance in border plants. The most useful Dahlias for the garden are of dwarf habit, with stout foliage and short joints, for without this no amount of staking and tying will keep them tidy when rough winds begin. At the same time the flower-stems must be long and rigid, for if short the blooms are hidden and bad when cut; if long without stiffness, the flower-heads hang forward and downwards so that their beauty is equally concealed. Further, they must be free and early in bloom, of clear decided colours, and with petals of sufficient substance to stand bad weather and to last when cut. Perfection is uncommon even among plants, so that it is rare to find Dahlias combining all these merits, and too many of the new kinds are sadly deficient. Taken all in all, there are probably none better for border work than some of the old kinds now discarded, for though their centres were not all perfect, and they showed less refinement of form than the newer type, yet for display in the autumn border, and for cutting, nothing grown to-day is better. But this is beside the point; the new forms have come and bid fair to stay awhile, and some of those now grown are really beautiful, so that we need not grudge them a welcome. None the less it is well when choosing new kinds to get those good in the border, and it is this point of garden value which is often lacking and cannot be seen at a show. We have, therefore, made notes of the new kinds grown in the trial borders at Chiswick, with regard to their merits for effect. For ease of reference they are roughly classified according to colour.

WHITE FLOWERS.—The white Dahlia is always in request for cutting, so that a good new white is sure of a fair trial; amongst these *Winsome* is really fine, borne on a plant of good habit and foliage, with the large blooms well shown and with that suspicion of green in the incurved petals which seems to enhance the beauty of a good white flower; many good blooms have been shown, but the flowers are rather large for cutting, and at Chiswick some of the centres seemed faulty. *Lord Roberts* is of another form, free, and if small for the show

is of a better size for decoration; its fault is that though the stalks are long the flowers tilt forwards and down, which spoils it for the border. *Spotless Queen* is a similar flower with the blooms held more erect, but they are shorter in stalk and less good for vases. *Cheal's White* is a plant of finest habit, dwarf and robust, with ivory-white flowers, but it seemed a little late, and the flowers have too much of the forward tilt. *Peace* is not at all a show flower, but for the garden is as good as any, with many flowers, which are well displayed on long stiff stems. *Purity*, which claims to be the best white Cactus, was not in the collection; its flowers are faintly tinged with yellow.

YELLOW AND ORANGE FLOWERS.—Why it is that yellows are so often badly carried is not easy to explain, but the fact remains that these more than any show this fault, so that though there are fine flowers, good plants are scarce; the best border yellow at Chiswick was apparently an unnamed seedling. *Prince of Yellows* is a clear bright colour with a massive broad-petalled flower, but its habit is too scanty for a border plant. In form of flower *Mrs. E. Mawley* is an easy first, of a clear pale yellow, large, with narrow petals which are slightly incurved; as a vase or basket flower it has been well shown spite of its size. *Primrose* is a light yellow kind of good habit and foliage, the flower of large size, well carried on long stalks; *Canary* hides its blooms too much and has a poor habit. *Miss A. F. Perkins* is a distinct variety of the parti-coloured class, being pale yellow with white tips; it would seem a little late, for at Chiswick it was not in bloom and its growth tall and scanty. *Honeysuckle* is also distinct, but apart from this is not good in the border, its blend of amber half-tones being too undecided for effect. Several other yellows have colours inclining to orange or salmon-red, the most noticeable of these being *Florence*, conspicuous for its large flowers shaded orange, coming freely, but too pendant; *Mrs. Clinton*, one of Mortimer's novelties, with blooms of blending orange-yellow and salmon, large and free, but with a poor habit of growth; *Mrs. de Luca* is rather tall, with dark foliage in contrast to its blending shades of orange and yellow. However beautiful these changing shades may be near at hand, it is only one here and there that looks well at a distance.

ROSE AND SALMON-SHADED FLOWERS.—To this class the foregoing remark also applies, for good clear pinks are rare in Dahlias, though in blending shades there are flowers in which salmon-pink or rose predominate. Of this class is *Clara G. Stredwick*, a dwarf plant of good growth, and free in its salmon-coloured blooms shading to yellow at the base of the petals; *P. W. Tulloch* is a flower of complex shading, with a blend of salmon-red and rosy purple, which is uncommon. *Mr. Spencer Castle* is almost as difficult to describe in its blending tones of pink and orange, coming freely on a dwarf plant with erect stems; it is quaint and bright for the border but the centres are often faulty. *Mrs. John Barker* comes nearer pink, though the middle of the flower shows salmon shading; its habit is good and the flowers well displayed. *Britannia* is another uncommon blend of salmon-pink and brownish-yellow, not bright enough for the border.

SCARLET AND CRIMSON FLOWERS.—Of reds there is a large choice, but amongst them all *Amos Perry* is first, being tall but of good habit, of fine colour, the best form, large, and free; as a border flower it is first-class. *Mrs. Winstanley* from the Farnham nurseries is also good in its dwarf habit, dark foliage, and tones of bright soft scarlet. *Spitfire*, a clear scarlet, is good in everything save in the flower-centres, which seem uncertain, a fault shared with *Florrie Tranter*, which is in other respects just as good. The weak point of *Hetty Dean* is its faulty habit; its flowers are of good form and reddish-orange in colour. *Sailor Prince* is a deep red with long petals and of medium size; in its vigour it runs up rather too high. *Mabel Needs* shows a large flower of crimson-scarlet, but from their weight the flowers are too pendant for borders. Of the showy red and white flowers *R. Dean* is better in habit than either *Columbia* or *Gabriel*, which are too tall and weak in the stem, their blossoms often pointing downwards.

PURPLE AND PURPLISH-CRIMSON FLOWERS.—Of light purple, *Sea Queen* is a good variety, with pleasing colour, not too large, and the blooms well carried; it is of the broad-petalled class. Ruby-red shades are plentiful, *Imperator* being a large flower of intense colour; *Meteor* a plant of good habit but not in bloom, described as a distinct ruby-red with purple shading and

fine form; *Mrs. James Bailey*, with flowers of the same colour but yellow-shaded towards the base, hangs its head too much for the border; but in *Mrs. H. A. Needs* we have the right model, good in habit, free in flowers which are well carried, and of a fine crimson purple-shaded. Two or three striped fancies, including *Alpha* and *Duc d'Orleans* are not at all good.

DARK FLOWERS.—There are three of the new black flowers grown at Chiswick but unless in rare contrast these are of no value for gardens. *Aunt Chloe* is a narrow-petalled bloom of medium size and fairly free; *J. H. Jackson*, with rather more of crimson in it, has its blooms well displayed; while *Mrs. Cuthbertson*, for which first place is claimed amongst maroons, might be good were its colours less sombre. For variety on a stand these shades have their place, but in the border they are melancholy.

ASA GRAY'S LILY (*Lilium Grayi*)*

THIS pretty and very hardy Lily from the Alleghanies of Virginia and Northern Carolina was first collected and described by Dr. Asa Gray in 1840, but it has only recently found its way to this country in quantity. It is closely allied to the Canadian Lily, some botanists considering it to be a variety of *Lilium canadense*. Its bulbs are of annual duration, white and rounded, the scales closely compressed, the new bulbs being thrust 3 to 4 inches away from the old by stout wiry white connectives, eventually forming a long series of old bulbs that have flowered, with branches of new bulbs on both sides and at one end. The leaves resemble those of the Canadian Lily in their arrangement, each whorl containing five to ten leaves about 4 inches long. The stems are slender, 3 to 4 feet high, bearing nodding umbels of bell-shaped reddish-crimson flowers sometimes arranged, as in our plate, in

* With coloured plate from a drawing by H. G. Moon.



LILIUM GRAYI.

two tiers one above the other. They average 2 inches across the tube, are spotted maroon-black on the inner surfaces, with chocolate-coloured anthers within the tube. The plant is easy to grow in any damp, but not shady, situation, such as the banks of streams, or the cool fernery; it often appears quite at its best planted with the hardy Orchids and moisture-loving Iris. It is finest in peat and leaf-soil, or light loam with leaf-soil added to it. It should be planted in September or October, and flowers in July. Though somewhat sombre in colour as compared with the Lilies from western America, it is good in groups among low-growing shrubs or herbs in a moist corner, where it is more at home than amid border-plants of stronger growth and brighter colouring.

G. B. MALLETT, Colchester.

TOO MANY "PONTICUMS."—We are threatened with the marring of our best home landscapes by the ill-judged planting of the common *Rhododendron ponticum*. The fact that it is rabbit proof, and that it grows rapidly and flowers well in light soils, has caused an indiscriminate use of it. For cover, experience has shown us that it is totally unfit—rabbits, indeed, lie in it, and it is difficult to beat them out, but pheasants never enter it. This does not seem to be from any noxious properties in the plant, but because they cannot run freely between the close-growing stems as they can under other bushes. All shrubs are apt to annoy the eye if over frequent, and this is just the error into which we are falling with our *ponticum*s. As a rule the *Rhododendron* is best used in what are termed middle distances. It is there you will best enjoy its blossom in June and its verdure in winter. Do not plant it close to the eye, under the windows of your sitting-rooms, or along the terrace margins or walks. Keep those choice bits for choicer plants, for delicate shrubs, or the finer hybrid *Rhododendrons*, the foliage of which is better than that of *ponticum*. But hang them thickly on that sunny hill-side up to the very crest, and fill with rich masses that dell, into which you look down from the frail foot-bridge, or the solitary wood-walk high above; then you will know how to enjoy your *Rhododendrons* as you never did before.

THE GARDEN BEAUTIFUL. HOME LANDSCAPE AND HOME WOODS. FORMING WOODLAND RIDES.

WE have lately shown how to get rid of some of the worst of our now profitless underwoods, so often worn out, thin, and poor in effect; and now we take up a subject of scarcely less importance, namely, the tracing and making of simple rides through woods. These are necessary for shooting, as well as for the clearing of the woods, driving, hunting, and the pleasure of riding or walking in them, and they are often best dealt with in replanting worn-out underwoods. The older and more picturesque the woodland, the easier the task of making drives pleasant to the eye at all times as well as right for use, though it is not unusual to see many woods without rides of any value. It is not a hard task to improve them, making them at first a little more open than is common, and cutting away here and there to bring into view good groups of trees, or any helpful incident such as a gully of Ferns. Native plants are often beautiful in masses near these rides, and their effect seen in any clear way in shade is as good as that given by any exotic plants. These are among the right places to have beautiful native plants that may be absent naturally in the district, such as Solomon's Seal, Lily of the Valley, and Willow Herb; also many of our hardy Ferns, introduced again to their home in moist spots in the woods, sorts such as the Royal Fern, robbed by the hawkers from the many spots in the home counties where it once graced the shade with its stately form.

Groups of neglected native shrubs might be planted here and there, and native trees not often planted in the usual mixtures, such as the Aspen and Field Maple, may be brought into the wood-fold. In warm and sea-shore districts not often stricken by severe frost, we may have groups of Pampas Grass, New Zealand Flax, and hardy Bamboo here and there, but generally through the land it is better to trust to good native things. And, if we go beyond these, let us take care that the shrubs are as hardy as any of our own bushes; it is easy to find them in the shape of hardy Azaleas and Rhododendrons, and the beautiful Mountain Laurel (*Kalmia*), where the soil is not against them. Woodland rides should be not less than 18 feet wide, and it would be no loss from a shooting or any other point of view to make them a few feet more; if a ditch must be made on either side to get rid of water, it ought to be in addition to the 18 feet. Their surface should be of the things of the wood—Grass, Moss, dwarf Heather, Thymy turf, brown leaves—according to soil and elevation and other conditions. Among other reasons for this is the fact that such surfaces drink up and keep for use the water that falls, whereas if it falls on bare surfaces our drives and paths may become water-courses. In very hilly ground we may have to cut rides out of the hillside, and make our drive of shale or rough gravel, sand, or peat. In these, or on any surface where we cannot find a protecting carpet of vegetation of any kind, we may have to form little hollows skew-wise across the walk so as to throw the storm-water

aside. Woodland drives should want no care beyond the annual “fagging” which the gamekeepers do to remove Briars and all interloping rank growth before shooting begins. But in woods of any beauty coming near the house, it may be worth while to rough mow them now and then.

SUNNY SPOTS IN WOODS.—Shade is one of the summer charms of the woods; but in case the shade is too great for any of our plants or bushes, we have a chance for sun-lovers in glades or open spaces, like those so often seen in natural forests. These are to be sought now and then in our woods for the sake of various things—game, sun, light and shade, and the variety of tree form which is often seen around such openings. The floor of these glades may be of turf, Fern, Ivy, or any mixed plants of the woods, and they give us also a good place for evergreen or other covert:—Savin, dwarf Mountain Pine, Partridge Berry, Heaths, either Cornish Heath or the more vigorous forms of Heather, and, if we can spare them, brilliant bushes like Azaleas. Bushes needing sun and warmth might be grouped in such spots; and in districts where the cold does not strike hard, as in a great length of the shore-lands of our islands, other exotics might be tried. But they should be chosen with care, and only sought for some distinct quality. Incidents of the wood itself will often offer the best places for our sunny spots, and there might be small openings, too, in shade, suggested often by wood plants like Gerard's well-named Stubwort (*Oxalis*) and Primroses. As trees take the place of underwood there is more need

for our woodland sun-spots, and also for the drives through the wood being more open and airy, providing always that the too common way, of thinning trees in a wood so that each stands singly, be given up. This is a harmful though well-established British practice, and against all profit or other good from woodland.

However, without any "fine" planting or attempt at the artistic as regards planting choice shrubs, by studying carefully the lines of easiest access, grading in hilly districts, and the convenience of varied labours or pleasures of the woodland, we often gain a very beautiful result. I have made several miles of these rides during the past winter, and no labour has ever given me greater pleasure in the result. Where the ground is level the work consists of merely taking out old and often worn-out stubs. Where it is sloping it is a little more laborious, but even then not difficult. Where the woods have been a little neglected and are rather worn-out it is often easy to get as good a line where the ground is bare of trees as where it is well set with them and thus avoid felling timber. Sometimes I crept under a great group of Oaks or Beech trees for the sake of their fine stems, and got a better effect than had I avoided them, beside using ground where nothing would grow. In some cases the result was so striking that parts of the woods, before unnoticed, became picturesque even in the opinion of artists; the airy foreground and the fine view along the clearances giving good pictures when the trees happen to come in the right

way. Where there is much disturbance of the ground I sow mixed grass seeds as soon as possible afterwards, mainly in April, but also in the summer and autumn. As to game, the airy rides are a distinct improvement in every way, creatures of all sorts getting a chance to air and sun themselves in the clearances. The gamekeepers like it much better, and my woodman tells me that he always finds the best trees near the open rides. So that nothing is lost and everything is gained.

* * *

BEAUTIFUL IRISH ROSES.

ALL who know Irish gardens and anything of the soft climate of Ireland, its open warm soils, and its special fitness for plant and tree growing, must have regretted that a country with so many natural advantages should not have more good nurseries. Now, however, we are glad to record a brilliant exception, and that in the direction for which the climate of France had hitherto seemed the best, that is for the raising of the most beautiful Roses of our time, beyond those of all times in beauty. The garden Roses have gained wonderfully in our day in continuous bloom; we can count on their beauty not only in the old "time of Roses" but far through the summer, and as we now write, in the first days of October, gardens are still beautiful with Roses where people have the wit to use the right sorts. Among all the Rose-growers in Britain who have joined in this improvement, the most distinguished are Messrs. Dickson of Newtownards, and, impressed with the value of their gains, we requested Mr. W. J. Grant to give us

an account of them for FLORA, which he has kindly done as follows :—

Mr. Alexander Dickson, with his brother, Mr. George Dickson, have for more than twenty years devoted themselves to the raising of seedling Roses at Newtownards, Down, Ireland, and their efforts have resulted in a distinct race of Roses, hardy, free-flowering, and suitable for every purpose for which Roses are grown. It has been my privilege to follow the progress of their work during many years and to mark the success that has crowned their efforts. The engraving given of the beautiful single hybrid-tea *Irish Beauty* leads me to speak first of their single Rose gains. Of these, six have so far found their way to our gardens, three of them being pure teas, viz.: *Irish Modesty*, a sturdy grower, flowering from June till October; when expanded the flowers are large, but in the bud they are long and pointed, and of a fine coral pink. *Irish Star*, with large cup-shaped flowers of great beauty, a *Rose du Barri* shade, with a star-like lemon centre and rich dark golden stamens. *Irish Pride*, a single Rose of finest form, and blooming continuously upon every shoot from early summer to late autumn. *Irish Beauty*, a charming single rose; the flowers are large, of the purest white, with centres filled with clear, golden anthers in beautiful contrast with the stout white petals. *Irish Glory* is of more robust growth, with buds of great length, the open flowers of a rich deep pink toned with silver, borne upon stout shoots clothed with large, handsome foliage. *Irish Brightness* well deserves its name, possessing a distinction and at-

tractiveness all its own, from its glaucous growths, beautiful foliage, and the way in which growth after growth produces large sprays of vivid crimson buds, which on opening show a zone of silvery pink toning off to silvery white. *Engineer* is a hybrid-tea of another type, short and sturdy in growth and rich in vivid carmine flowers coming freely on every shoot; in fact, just the kind to produce a bright effect in a small space. There are many other beautiful and distinct single Roses that in due time will come from Newtownards to grace our gardens—Roses varied in their form, habit of growth and height, and with every shade of colour.

To give the most complete satisfaction Roses must not only be fine in the open garden, but good when cut, and amongst such varieties none are better than *Duchess of Portland*, *Lady Moyra Beauclerc*, and the handsome *Duchess of Westminster*, a hybrid-tea which may be justly called a “great” Rose, with wondrous depth of petal and perfect form, combining the good qualities of *Mrs. W. J. Grant* with those of *Killarney*, its colour being a combination of these two. As true artists with a love for natural beauty, however, our Irish friends have not confined their efforts to exhibition flowers, but have given us a series of fine kinds for gardens, commencing with *Lady Helen Stewart*, with bright crimson flowers, sweetly scented, and abundantly produced; this, followed by a long list of such sorts as *Mavourneen*, with its colour of silvery rose; *Marjorie*, with blushing flowers sometimes almost white, and finely formed; *Meta* and *Beryl*, dainty



ROSE "IRISH BEAUTY." (Engraved for "Flora" from a drawing at Gravetye.)

little teas; while as more robust but equally beautiful garden Roses we have the fine *Ards Rover*, a hybrid-tea, very fine as a big bush, with handsome foliage and dark crimson flowers; and *Ards*

Pillar, one of the finest strong-growing Roses that it has been my lot to meet, and quite distinct from any other, showing large flowers in profusion of a rich dark crimson. This is first-rate as a

climber or large bush, and its wealth of flowers good, either for cutting or show. While alluding to the bush Roses sent to us from Ireland I must call special attention to one worthy of a home in the garden and heart of everyone who loves a Rose for its own sweet sake; *Margaret Dickson*, the lady after whom this Rose is named, being the mother of those who are doing so much for our national flower. May her namesake be treasured as long as that lady's name and memory will live in the hearts of those who knew her. This fine Rose flowers with freedom, and even in a town garden bears fine almost white blooms. Though this race of Irish Roses have amongst them many of the best kinds for gardens, many of them are also of value for the shows, for during the last seven years our best exhibitors have shown many fine examples of these new kinds. Thus among hybrid-perpetuals fine typical blooms are seen of *Margaret Dickson*; *Mrs. Sharman Crawford*, a rich rosy pink, beautiful and distinct; *Ulster*, large, massive, and handsome, sweetly scented, and of a bright salmon colour; *Tom Wood*, of cherry-red colour and of good form; *Marchioness of Londonderry*, a fine flower in ivory white; *Marchioness of Downshire*, a beautiful rose in satin pink; and *Earl of Dufferin*, perfect in form and brilliant in rich dark crimson, with *Marchioness of Dufferin* forming in her satin pink colouring a striking contrast to the flower that bears the name of one who served his country well. Of recent years our choice of hybrid-teas has been increased by *Killarney*, always good in pink and silver sheen; *Bessie Brown*,

creamy white, large, and fragrant; *Mrs. J. W. Grant* in imperial pink, and *Mildred Grant* with its deep petals and shapely outline of silvery white, shaded or flushed with pink; *Countess of Caledon*, a distinct richly-coloured carmine rose, sweetly scented; and *Duchess of Portland*, pale yellow and of grand form; *Alice Lindsell*, in cream and pink, is a Rose with a future; *Edith Dombtrain*, a fine white Rose by the side of *Liberty*, a flower of shapely form and brilliant crimson, makes a telling contrast. Collections are also improved by the presence of such teas as *Mrs. Edward Mawley*, bright and fragrant, with pointed centre and reflexed petals of bright carmine, tinged and flushed with silvery salmon; and *Muriel Graham*, always good in her pale lemon, shading to white. So much for the best show flowers, which times out of number have gained the silver medal of the National Rose Society for the best single blooms in the various classes, than which there is no greater honour. In classes of twelve blooms of one variety similar results have followed, growers from all parts securing first place with one or other of these Irish Roses. Since 1887, Messrs. Dickson have sent out no less than fifty-four new and beautiful Roses, though, owing to climatic and other causes, but a small proportion of their gains have been submitted to the National Rose Society. Nevertheless, sixteen of the gold medals offered by the Society since 1890 for new flowers have been won in open contest by Roses raised by this firm.

The following seedlings have been named but not yet sent out:—*Mrs.*

David Mackay, a fine pure tea with pointed upright flowers, large, distinct, of pale yellow colour, and an excellent grower (awarded the gold medal of the N.R.S.); *Dr. Campbell Hall*, a grand rose, showing that infusion of yellow at the base of the petals which is such a characteristic of this race, in this case finely blended with the coral-rose of the well-formed flowers; *Duchess of Westminster*; *Charles Graham*, a hybrid-tea with large flowers of crimson-scarlet with pointed centre; *Countess of Annesley*, with reflexed flowers in a fine shade of silvery salmon; and *George Dickson*, another hybrid-tea of the best class, flowering on every shoot, and, in the judgment of critics, the finest crimson exhibited this year. A number of seedlings, each having its history and origin carefully noted, are being tested, and will, it is hoped, soon be sent out as worthy of a place among the great garden Roses of our day; but as they are not yet named or increased, I may not usefully say more of them here.

W. J. GRANT.

THE BROWSING LINE.—In pastures this is often very ugly and hard, and few people seem to have the wit or courage to get rid of it—by no means a difficult matter. We should always remember that trees grow in the true forest as columns not bushes, and the isolation of a tree in pasture, by causing it to branch all round, gives it often a shape far from beautiful, and by allowing the cows to do the pruning we do not improve matters. It is bad in another way by overweighting the tree with branches, because many of these lower limbs the tree itself tries to throw off as they become feeble and worn out. The right thing to do in many such cases is to remove the browsing line by trimming as far as the true framework of the tree, which often begins 10 or more feet above it. The tree loses nothing of value, and in a few years, if we cut away the branches a few inches from the stem, the effect will be just as good and often better. In many cases we have cut away the branches to a height of 15 feet, and no harm has been done.

A WILD GARDEN IN VIRGINIA.

SEPTEMBER, in this part of the country, is usually a dry month. The roads are hot and dusty; the garden has a discouraged air; the leaves are limp and withered, and the flowers droop from their stalks. The only fresh and verdant spots are the banks of streams and the moist places of the farm where the springs well up from the limestone rocks underground. The little farm at Rose Brake is bounded on the east by a stream that winds through beds of Mint and Moss, and many gay blossoms now in their prime. On either side of the stream are acres of unredeemed marsh-land of which we have made a present to Nature, and over which she holds sway. Here beauty revels in these September days in a riot of colour, and bold and picturesque effects. This is Nature's garden, far out-rivalling our poor attempts at cultivated borders on dry and rocky hillsides, which are only successful in spring and early summer. It is to the marsh that we go with shears and baskets now to garner some of this lavish harvest of bloom for the decoration of our home and the little church, and various are the surprises here. In one place the stream runs between beds of a low-growing, showy yellow flower, the common *Bidens*, first cousin of the hateful Spanish Needles, but which makes here a pretty picture of dewy freshness by its lavish display of bright golden blossoms set in greenest grass. Then there are large patches of the crushed-raspberry-coloured Joe-Pye-weed, with fringes of *Eupatorium ageratoides* to give variety. In another place a rank growth of Golden-rod and yellow Cone-flowers is mingled with the reddish-purple of Iron-weed, and Marsh Thistles 6 feet in height, of the same reddish hue. Here are flowers, not in primly ordered borders, but in masses of bright colours, acres in extent, harmoniously arranged and blended by the master-hand of Nature. Here are no conflicting hues; no stiff monstrosities; no double Sun-flowers and Dahlias, and China Asters and Zinnias, whose colours set one's teeth on edge, all in a meaningless jumble, without form, and void of beauty, such as one sees in the gardens hereabouts. The effect of our bright marsh garden is toned down by its quiet setting in wild shrubbery, which includes several species of Willow, and Wild Roses, Viburnums, Thorns,

Sycamores, and many other plants. Here, too, is much Bitter-sweet; and there is Honeysuckle escaped from cultivation; and the native wild Grapes festoon at will the Plums and Cherries on the banks of the stream, and huge rocks form gloomy recesses, where Ferns and Mosses love to grow, and birds to build their nests. Tall rank Sedges and Grasses gone to seed mingle with the brighter colouring of the flowers.

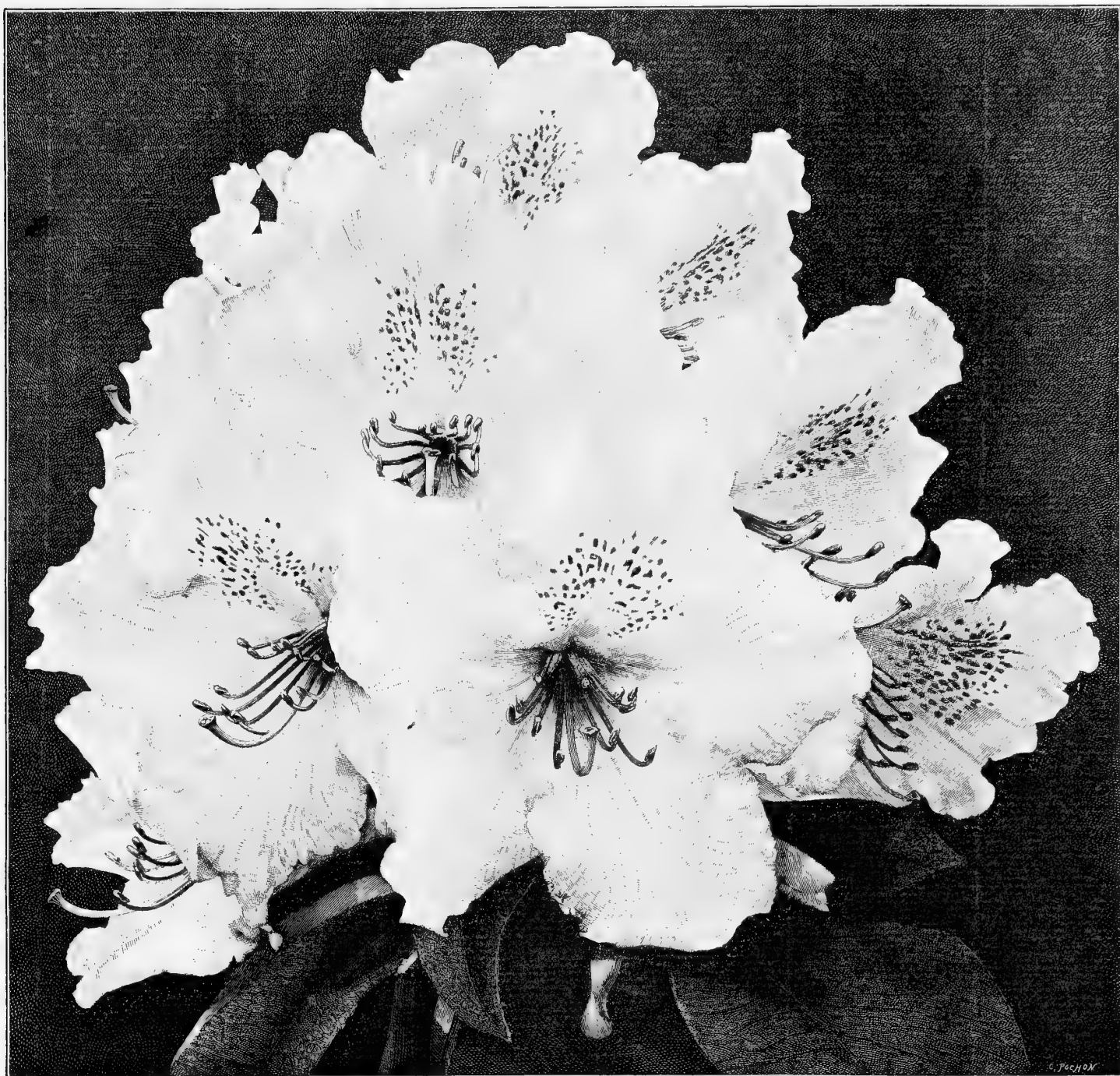
The Aster garden at Rose Brake is now in full beauty, but how greatly it is eclipsed by the wild Aster garden in the marsh! Here is a clump of Lowrie's Aster (*A. Lowricanus*), the stems 4 feet high, with numerous loosely panicle heads of small light blue flowers. It is too rampant in habit of growth for the garden. Abundant also is the thin-leaved Purple Aster (*A. phlogifolius*), a distinctive mark of which is the long, thin leaves, 6 inches long, and dark green; this is a noble Aster, 5 or 6 feet in height, with showy, large heads of bright purple flowers. The marsh is also the congenial home of the New England Aster in several forms, in one place a form with bright pink flowers grows 7 or 8 feet high, in company with the tall Marsh Thistles, with their silvery green stalks and reddish-mauve flower heads. *Aster puniceus*, another marsh Aster, too large for the garden, is common here. The stalks of this Aster are reddish-brown, effective in the mass, 8 feet in height, and abundant, in large blossoms of a pale violet-purple colour. Where the soil suits this Aster it blooms abundantly, and presents the aspect of a cloud of soft and tender pale blue. *Aster paniculatus* is a much-branched sort, with smooth, green stems, and flowers of white, or faint lavender-colour. This is a graceful Aster, tall and spreading, which should be introduced with caution into the garden.

There are several kinds of wild Sunflowers in the marsh. Here is the narrow-leaved or swamp Sunflower, not a very showy sort. It grows from 5 to 7 feet high, is few-flowered, the heads about 2 inches across, bright yellow with purple disks. The tall Sunflower, *Helianthus giganteus*, is much more effective. It has great reddish stems, sometimes 10 or 12 feet in height, narrow leaves, and heads in small clusters, bright yellow, and 3 inches or more across. *Helianthus decapetalus* is a graceful wild flower, 5 feet in height, with slender stems, and light

yellow flowers in clusters. These flowers are 3 inches across, with yellow disks. It is one of the prettiest of the wild Sunflowers, and abundant in the marsh. Blue flowers are welcome here, perhaps because they are not so common as red and yellow wild flowers. In the marsh in some places, the ground is carpeted with *Eupatorium caelestinum*; this is a very pretty, Ageratum-like flower, of a lovely violet-blue. When one sees it growing in wet, peaty ground, one realises that it is really a fine thing. In the dry flower borders on the hill it blooms sparsely, and does not look happy. Another blue flower that is effective in the marsh is the spreading *Commelina Virginica*, with smooth green leaves, curious flowers which have green sheaths, and a corolla of three sky-blue petals. I have tried a patch of it in a shady bed, but find it somewhat of a nuisance, spreading rapidly, and crowding out more valuable plants. All things grow with almost tropical luxuriance in the moist, black peat of this marsh. I notice, in one place, a patch of the ordinary *Cuphea viscosissima*, an insignificant little plant as seen in dry soils, but here, occupying a space several yards in circumference, of rank growth, and in lavish bloom, it makes an effective display of its light magenta flowers, contrasting not unfavourably with some near-by clumps of Coreopsis. By the borders of the stream the Jewelweed (*Impatiens*) bends in luxurious masses, displaying its spotted orange-coloured pouches in great profusion. There are two species in the marsh, the one just described and another called *Impatiens aurea*, which has pretty lemon-yellow flowers sparingly dotted with reddish-brown. The orange-coloured sort is *Impatiens biflora*. In a damp corner of a meadow we find a large colony of the blue Lobelia. No other flowers are near by to mar the effect of the bright blossoms growing out of the fresh bed of Mint, and Marsh Grass; and it is a delight to sit upon a mossy stone and listen to the weird cry of the upland plovers circling overhead, and revel in the blue and green surrounding one in perfect accord with the clear blue of the sky, and the tender green of Honey Locust trees, that overhang the spot. From this point of vantage we survey the extent of the marsh and take in all its beauty, and are glad.

DANSKE DANDRIDGE.

West, Virginia, U.S.A.



RHODODENDRON "PINK PEARL." (Engraved for "Flora.")

RHODODENDRON "PINK PEARL."

AMONG the many hundreds of hardy hybrid Rhododendrons that have been raised there are none that can compare with this variety, which was first shown at the Temple Show in 1896, and was at once noticed as a first-rate novelty. The demand for it ever since has been so great that the raisers, Messrs. John Waterer and Sons, Bagshot, have barely been able to supply it. It

is quite hardy, growing equally as well in the north of Scotland and near the smoke of Manchester, as in the south and west of England. We have also the very best accounts of it from Adelaide, Australia, and from South Africa, where we hear from Mr. Arderne of Capetown, "that the *Pink Pearl* you first sent me is now over 6 feet high, and when last in bloom was the admiration of all who saw it." *Pink Pearl* marks a distinct break in hardy Rhododendrons, the lovely flesh-pink colour of its large flowers

raising it above any other kind. There has been a great deal of discussion as to its parentage, and although I do not in the present article intend to give its immediate parents, we can say that it was raised from the results of crossing two hardy hybrids, and is not, as has been said, a direct *Aucklandii* seedling; yet it throws back to that strain. Beside its beautiful colouring the size of the blooms is remarkable; I have measured individual flowers in a truss that were more than 5 inches in diameter. The advent of *Pink Pearl* has to a certain extent overshadowed the fine qualities of several other good novelties raised at Bagshot. We may refer specially to the following as being quite in the first rank of hardy hybrids:—*Lady Clementina Walsh* and *Gomer Waterer*, two varieties raised in the same batch and bearing marked family likeness. They are both white, but finely coloured at the edge of the petals with a delicate rose. The size of the blooms is above the average, and both are good in leaf and habit. *Viscount Powerscourt* is a fine red with heavy markings on the upper petal, and a very showy kind. Other good kinds are *Mrs. Tritton*, a bright crimson with light centre; *Charlie Waterer*, scarlet with light centre; and *Marquis of Waterford*, a clear pink similarly shaded—all of them good. Great care has of late been taken in the naming of new kinds; in fact, it is our practice to flower them several times before deciding on their merits, it being impossible to judge of their value without this time of testing.

F. G. WATERER, Bagshot.

TREES OF THE PINE TRIBE FOR WET GROUND.—A friend in America writes that the deciduous Cypress, the Western Arborvitæ, and the Hemlock Spruce, all thrive in very wet ground, as does the Norway Spruce, and we believe also the Menzies' Spruce. We rightly resort to trees of the Pine tribe for sandy or stony hills, but it is well to know that we are not obliged to confine ourselves to Willows and Alders on wet heavy bottoms if for any reason we prefer an evergreen tree. In southern parts of Britain where the Norway Spruce, after its first youth is past, is such a failure, we have often noticed good results from it by streams and in heavy bottoms. The Sitka Spruce, also a very valuable tree, is excellent so far as we have tried it in similar situations, and we have noticed the Douglas Fir thriving very well in hollows in wet woods. Even the Silver Fir, a tree that is not always happy in stiff and dry soils, we have seen making a fine growth near water.

THE MYRTLE.

THOUGH there are some hundred or more kinds of Myrtle scattered mainly over the southern hemisphere, the well-known kind lauded by the ancients, and still a favourite in our day, is the northernmost of its great family. It is common as a shrub or low tree throughout the south of Europe, northern Africa, and western Asia, and is hardy in some parts of our own country. In all the Mediterranean region it occurs as underwood, variable in height (from a few inches to 12 to 15 feet) and quite as much in leaf; the most marked of these forms bear distinctive names. Old plants form a spreading root-stock, or, more rarely take on a standard form, when the stem is sometimes found of the size of a man's leg; but owing to the constant cutting of undergrowth, to forest fires, and the browsing of goats, such a girth is uncommon. As a wild plant it grows best in moist and half-shady bottoms, but does not bloom in such places so well as upon the open hill-sides where, even in the driest places, small-leaved forms contrive to bloom and fruit profusely, many birds of passage feeding upon the berries during their southern flight in autumn. When distilled, its leaves and young shoots yield a fragrant oil, known as *Eau d'Ange*. It was first brought to this country at the close of the fifteenth century, and has been much grown in old gardens as a trained or specimen plant in tubs, or upon walls where, with slight protection, it passes the winter uninjured in mild and southern coast districts. For either of these uses it is a beautiful object, fine in flower, and the foliage useful when cut; it does well in any light porous soil, but must be freely watered and syringed to keep down thrip. The many tropical and southern species are commonest in South America, though several kinds are found in Australia, New Zealand, and adjacent islands, and two or three far towards the antarctic zone. Of these but few are in cultivation, but the following may sometimes be met with in collections:—

NEW ZEALAND MYRTLE (*M. bullata*).—A rigid-growing greenhouse shrub from New Zealand, with leaves reaching a length of 2 inches and often strangely netted and crinkled. It grows 10 to 15 feet high, bearing solitary flowers of a pale rosy colour, followed by black urn-shaped berries.

ANDIAN MYRTLE (*M. Cheken*).—A handsome half-hardy shrub from the southern Andes, with dense spreading habit, small leaves thickly set, and an abundance of white fragrant blossoms.



EUROPEAN MYRTLE (*M. communis*).—The common form of southern Europe and of gardens. Its varieties include the Orange-leaved Myrtle; a Spanish form from Andalusia, with large leaves; the Belgian Myrtle, a small-leaved form with a variegated sub-variety; the Double-flowered Myrtle, with flowers of long duration; the Italian Myrtle, a distinct variety with several forms of variegation; the Thyme-leaved Myrtle, with very small leaves, much used in wedding and other bouquets; the Roman Myrtle, also in several forms; the Rosemary-leaved Myrtle, with long narrow leaves on neat spikes and small white flowers coming later than most in autumn; and *tenuifolia*, very distinct in its drooping habit, which is pretty in baskets or on a pedestal. There is also a form with creeping or prostrate habit, one bearing white berries, and one in which the flowers are faintly tinged with rose.

SWEET MYRTLE (*M. fragrans*).—A stove shrub from the West Indies, growing 8 to 10 feet in height and bearing thick leathery leaves that are nearly round, smooth, and shining, and white flowers coming early in the year.

CHILIAN MYRTLE (*M. Luma*).—A beautiful shrub 3 to 5 feet high, with sharply pointed leaves and fine flowers larger than those of the common Myrtle, and borne in bunches of three or more during early summer. A greenhouse plant formerly classed with *Eugenia*. Syn. *Eugenia apiculata*.

CHINESE MYRTLE (*M. tomentosa*).—A handsome shrub bearing ovate leaves of bright green above, but clothed beneath with white, silky hairs; the flowers appearing in May or June are large, and pale rose in colour. China. Greenhouse.

FRUIT-BEARING MYRTLE (*M. Ugni*).—A half-hardy shrub reaching at length some 6 to 8 feet in height, and not unlike in appearance the wild Myrtle of Europe. Its flowers are larger, with sometimes a rosy tinge, and its fruits of a warm reddish brown, when carried in profusion are very handsome and strongly fragrant; in Chili, its native country, they are much used as food. It should be grown in rather heavier soil than the other kinds, and does well planted out in the greenhouse, being hardy only in the south-west of Britain. There is a variety with variegated leaves. Syn. *Eugenia Ugni*.

EARLY MUSCAT GRAPES.

MR. GEORGE BELLAIR has written the following paragraph in the *Revue Horticole* upon little-known varieties of early Muscats; as being kinds new to English growers we produce the subjoined notes. The best early Muscats known to French growers comprise some half-dozen varieties which may be classed according to colour as follows:—

WHITE GRAPES:—*Précoce de Saumer*, *Précoce de Puy-de-Dôme*, *Saint-Laurent*, and *Org Tokos*.

BLACK FRUITS:—*Lierval*, *Hâtif de Marseille*.

The variety *Précoce de Saumer*, the earliest of Muscats, is old and well known under many local names. Its bunches are small, and hence, though good in flavour, it has been somewhat neglected for larger-growing fruits. It is the most marked in flavour of early Muscats, but the strength is not unpleasant to most palates. The Muscat *St. Laurent* ripens but a few days in advance of the Chasselas. Its small loose bunches are formed of fruits also small but of a fine golden yellow and slightly scented. The Muscat *Précoce du Puy-de-Dôme* comes in with the Chasselas and is better than the two first-named; its flavour is refined, and it rarely spoils from wet. The vine *Org Tokos* is a new variety from Hungary, of normal vigour, early in leaf and late to shed them, bearing short, loose bunches of medium-sized fruits with a scent of

orange flowers ; it ripens a full week before the Chasselas, immediately following the earliest white kinds. The vine *Lierval* appeared at Angers some 30 years since, and is remarkable at first sight for its long joints, giving the effect of scanty foliage. It is fairly vigorous and fertile, and its shoots should be left long. The bunches of fruit are small and compact, the berries being of different sizes on the same bunch ; the slight musk flavour is only developed as they ripen. The *Hâtif de Marseille* matures very early, following the first Madelaines. It is fertile, fairly vigorous, producing loose bunches of fair size, composed of medium-sized fruit of good flavour and appearance ; its tough skin makes it well adapted for export and travel, and as an early Grape it is being largely planted in the south.

THE MUSTANG VINE.—As I was riding through a few hundred miles of forest in Louisiana and Texas, I found vines of the Mustang, apparently as old as the forests themselves, clinging to and flinging their arms from Oak to Pecan trees, Elm, Gum, or White Ash, as they came in the way ; and wherever they laid hold, like Sinbad's rider in the Arabian tales, they fixed themselves with so firm a grip that neither wind nor storm could shake them off, and there they will ride till time or the feller's axe clears them away. One hot day I had ridden thirty miles through the tall prairie grass, when we made the timber of the Brazos River bottom ; and judge my surprise when, for the first time, I saw a grove of Mustang vines and, what was better, Grapes. Our Mexican ponies were jaded out, and so were we ; and without ceremony we took off the saddles and turned them out to find water and food, knowing they would return at sunset for their corn. After half an hour's rest we commenced a ramble through the vine-covered forest. It was vegetation run wild with luxuriance ; nothing escaped the vines' spreading arms ; from the low undergrowth to the mightiest Oak or Pecan tree, the Mustang vine was master of the situation. The Grapes certainly were not equal to our Black Hamburgs, but for about ten minutes I thought them most delicious. Some of the stems were 2 feet and upwards in circumference at the base. The leaves of the Mustang are less indented than those of most of the European kinds, and have a thick white downy covering underneath. The fruit is as black as jet, the pulp firm, and less juicy than in any Grapes cultivated in Europe ; the bunches would average about half a pound in weight, but hung in profusion. After wandering about for half an hour, we came upon a crowd of settlers with their waggons, men and women busy collecting Nature's wild harvest of Grapes. On asking them what they were going to do with them, with a look of surprise they replied, "Make wine, to be sure."—W.

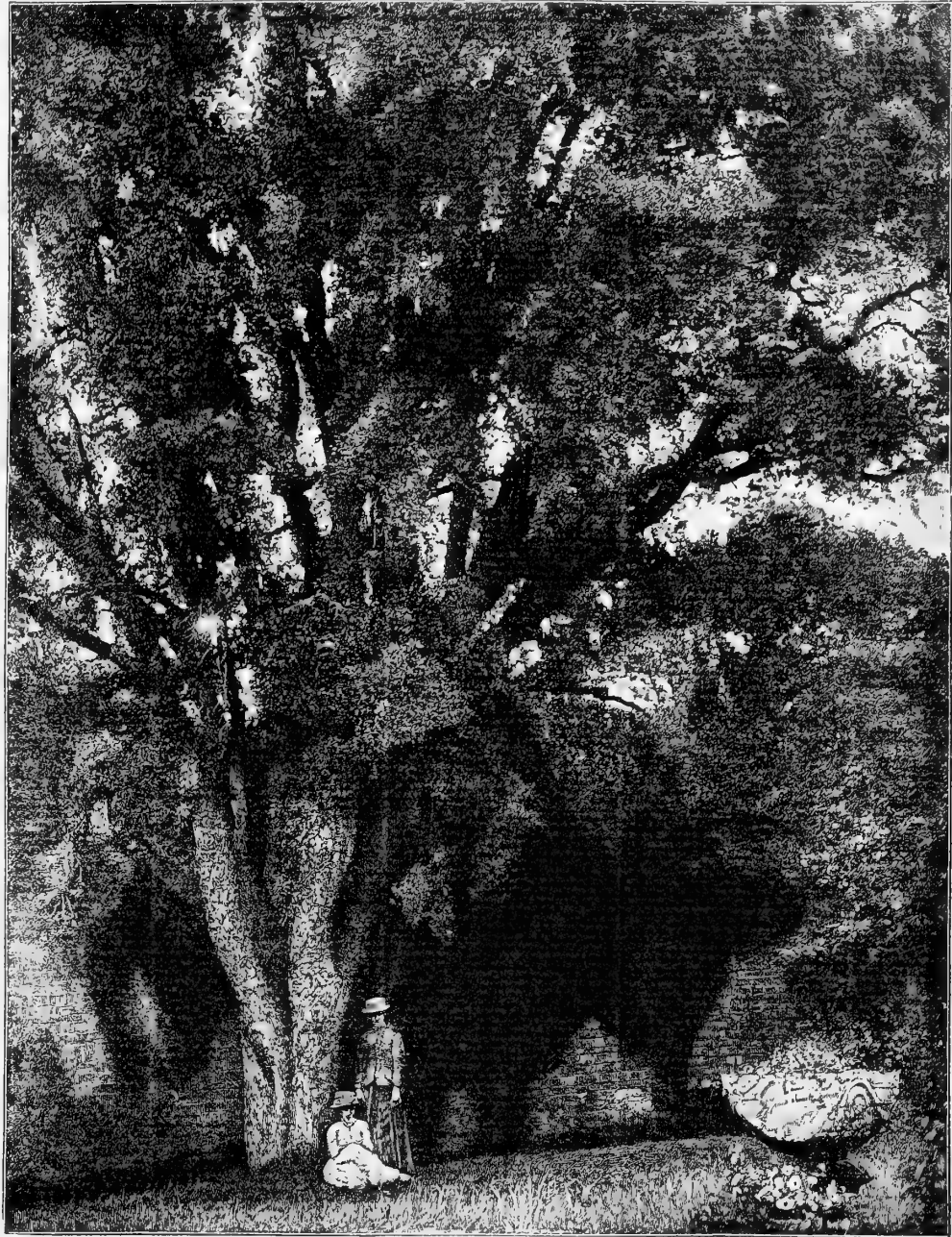
THE CORK OAK (*Quercus suber*).

THE Cork Oak has a peculiar charm of its own in its soft, often quaint, beauty, and the interest which it arouses when seen for the first time. Upon its native hillsides it is an essential feature of the landscape, with its rugged, irregular outline, most variable in direction and contour, with limbs and trunk knotted and gnarled and twisted, at times rising from a huge grey bole swelled into quaint form, at others breaking into several stems almost from the ground, or again rising in one rugged column. Whether sweeping low almost as a weeping tree, or flinging its branches here and there as though at random, or rising under one spreading dome of leafage, the rugged stems, now dark, now light, and the peculiar toss of its leaves and branches, have a charming effect. Far hardier than the Olive, it is found far into the centre of France, and in our country, though liable to injury in severe winters, this occurs rarely. In size and beauty the mature English trees fully equal those of southern Europe, where they are rarely as much as 60 feet high, though some old ones show a vast girth of stem. They thrive in any light, sandy, or even chalky soil, if well drained, but constant and stagnant moisture, heavy or limestone soils, and cold winds are fatal to them. If well placed their growth is rapid. In most of the southern counties fine trees may be met, particularly in Kent, Sussex, and the south-west of England, Wales, and Ireland ; while as far north as Cheshire and Staffordshire, and in so bleak a county as Suffolk, fine trees exist. Two of the best existed in Loudon's time at Mamhead near Exeter, one of them being 12½ feet round near the base ; others almost as remarkable are found in the south of Ireland, while even around London several fine trees are growing. The foliage of the Cork Oak is light and graceful, casting but a half-shade in which many plants thrive, it is therefore much used in gardens on the Riviera as a screen for tender or shade-loving exotics, or for climbers which are quite at home in its airy branches. In late spring when the young leaves take on a vivid green and the twigs are hung with myriads of catkins, and again as the old foliage turns russet and yellow before its fall, its beauty is ever-changing, particularly when in one group are found many trunks stripped at different times and varying in colour from red-

dish chocolate to warm brown, or a peculiar tinge of grey which catches the eye at a distance. The mature foliage is dark green, the upper surface of the leaves hard, shining, and often sharply convex, the under-side grey and downy and the acorns large and long, coming in prettily scaled cups. Trees vary so much in size and form of leaf and fruit, that botanists have sought to distinguish several varieties, but these merge so gradually into one another through intermediate forms as to render distinction futile. Impatient of change the Cork-tree is best grown from the acorns produced in abundance by mature trees, the kernels of which are greedily eaten by swine, and in times of scarcity have been used for human food. The wood of the Cork being irregular and coarse in grain is of little value save as fuel or for the making of charcoal of a good quality. In old trees it is dark brownish-red in colour and heavy, but brittle and liable to sudden fracture and rots so quickly as to be less fit for rustic-work than its appearance would suggest. The average life of the tree is about 150 years, but there

are few trees more uncertain in this respect, for though long drought does not affect it, large trees often die either suddenly or piecemeal, without any apparent cause. Great loss also occurs from forest-fires during the hot summers, while the myriads of ants with which most mature trees are infested have also a bad effect on their health. The bark, or spongy rind

3 inches in thickness, from which the tree derives its commercial value, is removed once in nine or ten years, during the late summer when the second sap is in movement, and comes away quite readily. Enormous forests of evergreen Oaks cover the mountains in Algeria and Tunis, and in the richer hollows



among these mountains their beauty is often great; but the country being fearfully hot in summer the growth on the exposed hill sides is not so good, and the trees often stubby. It is clear from the natural home of these Oaks that it is only in the warmer southern valleys and genial coast districts that fine results can be looked for from this beautiful tree.

THE BLUE AFRICAN LILY (*Agapanthus*), WITH ITS FORMS OLD AND NEW.

DURING the days when the range of choice was much less than now, this was one of the commonest of garden plants, alternating between the terrace-front in summer and the orangery in winter; and even to-day there are few better plants. All that it asks is shelter from severe cold, and moisture in dry weather, while it is free from insect pests and disease. With little trouble a stock can be secured by division, or the plants may be grown for years almost untouched if abundant water and manure is given; without this slight care old masses are apt to dwindle. The *Agapanthus* is most often grown upon terraces or stairways, in large pots or tubs, placed outside in May and housed in late autumn. Shallow tubs cut from strong casks are best for this, for, unless strongly hooped with iron, pots are apt to split from pressure of the thick white roots, and are beside more liable to accident when moved and the roots to suffer in hot weather. A good plan is to sink the plants, with or without pots, in an open position upon the lawn, the crest of a grassy bank, or above a low terrace wall; the arching leaves form a graceful fringe and the flower-spikes are seen to best advantage, lasting longer than when the roots are more exposed. Another gain is that the root-mass, which is rather out of proportion to the crown of leaf and flower, is hidden. They may also be finely grown near water grouped in massive clumps of a hundred or more crowns, which will yield a grand display during a good part of the summer; but in that case it will be well to choose young plants with light compact roots which can be readily taken up and stored in frost-proof quarters during winter, the crowns packed closely and with just enough moisture to keep the leaves crisp. Old plants may safely be left outside till Christmas if space is wanting, provided there is at hand a shed in which they can be put during sharp weather; in mild districts they are frequently so sheltered during the whole winter. There are not many inland places in which they do not suffer from wet or cold if left out altogether, though in favoured districts and mild winters they do very well in the warm angle of a wall, but they do not take kindly to long spells of

semi-darkness when covered from frost. Well potted in a mixture of good, rather stiff loam and leaf-mould they may be left for years with an occasional top-dressing, but there must be ample drainage. Fine mature plants will bear as many as forty to fifty spikes of blooms in a season. When dividing old plants they should be thoroughly soaked for some hours beforehand, the crowns can then be shaken apart with comparative ease; and without endangering the roots.

VARIETIES.—Beside a number of garden varieties, these include several distinct natural forms, but hitherto botanists have regarded them as local variations of one species. Of recent years other forms have been discovered, some of them very different from the type, but for the present they are best regarded as forms of *A. umbellatus*. These new forms, the description of which will be found below, include Messrs. Bull's new plant, *A. insignis*; *caulescens*, a plant distinct in habit, grown by Mr. T. Smith of Newry; and two new kinds, *Saint-paulii* and *Weillighi*, reported from Baden, and belonging to the group of small hardy varieties which shed their leaves in winter. Some of the garden forms include variegated plants, with leaves striped and ribboned with white or golden yellow. The following list embraces all the forms grown in gardens, with a brief note of their distinguishing features:—

A. u. albidus.—A small-growing plant, forming a large fleshy root-stock and losing its leaves in winter, when it is best taken up and stored dry; the flower-head is large and showy, though the pure white flowers are somewhat small.

A. albus.—The old white form of the plant, bearing white flowers; weaker in growth and generally smaller than the type.

A. albo-lilacinus.—A garden variety distinct in the colouring of its flowers, which are white, shaded blue, and in its habit, the flower stem hardly rising above the leaves.

A. atro-cæruleus.—A garden form with flowers of a very deep violet-blue.

A. bicolori.—A distinct variety of good form and habit, and bearing flowers white and blue.

A. candidus.—A pure white form, robust, and with flowers of great substance.

A. caulescens.—A new plant which has not yet shown bloom in this country but is distinct

in habit. Its stem is so developed as to give it a unique interest.

A. excelsus.—A fine garden plant, bearing immense heads of blue flowers on stout stems 5 to 6 feet in length.

A. flore pleno.—The double-flowered form, strong and robust in growth, handsome and lasting when well seen; sometimes, particularly if at all checked by bad weather, the flowers fail to open well.

A. giganteus.—A very fine garden form, with leaves broad and massive and throwing a stout stem of about 4 feet with an immense head, frequently of more than 200 flowers, of a dark gentian-blue with buds of a still deeper colour.

A. insignis.—The new plant exhibited last June at the Drill Hall by Messrs. Bull. Its principal deviations from the old plant are the peculiar whiteness of the base of the leaves, and the long flower-stems and tube of the corolla; these are both of such a length as to make a light but large head, the blooms well displayed in all senses. They are of a peculiar pale shade of lilac-blue, and numerous.

A. intermedius.—A form producing long flower-stems and a head of deep bright blue flowers; not very distinct.

A. Krelagei.—A variety blooming late in October when most other kinds are over; with large heads of deep blue flowers.

A. Leichtlinii.—A wild form from the Cape, differing in its large heads of light blue flowers, which are more compact than in any other kind.

A. maximus.—A garden development, larger in all its parts and of vigorous growth. Leaves broad and massive with stout stems of 4 feet or more, and spreading heads (over a foot across) showing in some cases over 300 flowers. These are good in colour, coming in two crops and lasting for weeks; there is a white form otherwise identical.

A. minor.—A distinct and fine variety, though smaller in all its parts. It belongs to the hardier and deciduous section, which may be wintered outside in many parts if the crowns are planted deep and covered during winter with a heap of cinders or other light protection. It is dwarf in growth, with leaves and stems slender and narrow, bearing heads of deep blue flowers; good in masses.

A. Mooreanus.—A form of the above, but with leaves shorter, narrower, and more erect, but also hardy, and deciduous even in a greenhouse. It has lived in the open for many years at Kew, in the rock-garden. The plant is very free, even tiny bits throwing one or more spikes of deep violet-blue flowers. It is said to come true from seed.

A. pallidus.—A garden form, with short rigid leaves and flowers of a pale porcelain blue.

A. Saintpaulii.—A new plant belonging to the *minor* section of hardy and deciduous kinds. It is distinct in character, dwarf and compact in growth, rising only 2 feet in height; bears many pure white flowers lasting for several weeks and good in contrast with the small blue kinds. Though probably as hardy as they, it should (until more common) be lifted, dried, and stored.

A. Saundersonianus.—A distinct garden plant with flowers of a deep blue in colour.

A. Weillighi.—A new plant recently found by a German explorer in Swaziland. It belongs to the section of hardy and deciduous kinds and differs by the drooping way in which its flowers, which are long and narrow, are held. It has recently flowered for the first time. There are in addition to the foregoing a few named kinds of slight importance, the best of which are *F. W. Moore*, with heads of large blue flowers; and *H. C. Hart*, similar but of dwarfer habit; and several forms with leaves striped with white or yellow and of small value for gardens. B.

DANGEROUS WATER.—The ugly pieces of artificial water, which so often disfigure our pleasure-grounds, are often the cause of fatal accidents. These result chiefly from the stiff way in which the margins of such waters are made. Instead of the bank gradually sloping into the water, as is usual in natural lakes, it is frequentlyhipped in a steep way, leaving the water too deep at the margin. All artificial waters near a house, or in any position where there is danger of children falling into them, should be made shallow and very gradually sloping at the margin. The bank of turf should slope easily and gradually into the water, never jump abruptly out of it, and the bottom should slope from the margin. So arranged, it is almost impossible that an accident can happen. And it is worthy of notice that the truest art and perfect safety go hand-in-hand in this case, for the common abrupt margin is an eye-sore, and wrong in every way, for the plants that grow on it and near it and the effects that should arise out of any happy union of shore and water.

ANEMONE CERNUA : WITH
COLOURED PLATE FROM A
DRAWING BY H. G. MOON.

THE Windflower family presents flowers of many colours and of great brilliance, ranging from red to blue and white, but no other species so far known in gardens shows the strange colouring seen in this new and handsome species. Anemones of many kinds are plentiful in Japan, where twenty-three species are named by Franchet and Savatier as natives of the Archipelago—a greater number than is found in the whole of Europe. The Russian dominions claim twenty-six species (according to Ledebour), and fifteen are described in the “Flora of British India” as natives of that region.

Anemone cernua is found growing in open sunny situations in the islands of Nippon and Saghalin, and reaches the mainland in Corea, extending inland all over southern Manchuria, where it is common as a mountain plant. With this wide range of country it shows great variation in size, in depth of colour, and in the greater or less abundance of the soft white silky hairs that clothe it in every part. The plant shown in our coloured plate was sent to Kew by Max Leichtlin of Baden Baden, in the year 1900, and flowered in a cold frame for the first time in April, 1902. The nodding flowers are subdued in colour, and there is a velvety richness in the dark sepals which is well set off by the wealth of yellow stamens, and the dense hoariness of leaf and stem. Seed has hitherto failed to ripen at Kew.

W. IRVING.

THE NEGLECT OF SUMMER LEAFING TREES.—During the planting season it may be well to remind the many who only plant conifers and other evergreen trees, without knowing how long they will endure the climate, how unfruitful their efforts are likely to be, compared with what might be expected if they worked with more lasting materials. Judging by the scant attention now paid to the planting of deciduous trees, one would suppose them lower in the scale of attractions than the Coniferæ, which are planted everywhere, though the summer-leafing trees are by far the more valuable over large areas in our country. A great number of conifers described as hardy are, for the most part, not really so as forest trees. They endure the climate for a while, sheltered in sunny nooks here and there, but a severe winter comes and kills them, or an easterly wind comes and half burns off the leaves. Unproved exotics, that thrive for a little while, but succumb to some unusually bitter spell of weather, we have given them everywhere places of honour that should be filled by trees more congenial to our plains, and as a consequence we often find disease or a vacant place where we looked for a long life of dignified beauty.

Some Pines are hardy, and it is impossible to embellish our country seats without their aid; but it is a mistake to depend almost wholly upon them, as many do. Then as to beauty, they are inferior to our finest flowering trees—inferior inasmuch as they are changeless, and without the charm of fair blossom. The common trees of the parks of Europe, with their massive trunks and limbs, and picturesque ramifications are finer than any Pines. Nor in this connection must we compare the giant Pines of the West with what we can grow in England. It is a delusion to think that our climate will ever permit the Sequoias, the Mexican, and some other great Pines to live for anything like the time that they have existed in their native homes, the long and brilliant summers of which are necessary to their growth. Few seem to take any interest in the newer summer leafing trees, and they are hardly ever grouped so that their beauty may be fully seen as tree-pictures. But, badly as deciduous trees are treated, they generally live, even in crowded cities and their suburbs, where conifers and



ANEMONE CERNUA

other evergreens perish annually in thousands. The millions of evergreens planted to perish in the smoke-fog of our cities are not worthy of a place with the few young Planes once placed in our city squares, which are now more majestic objects than one could find in many a wild forest country.

But the main thing to remember about it is, that the greater part of our British planted and garden land is on plains, and gentle hills with a low rainfall; whereas Pines generally are trees of the hills and are accustomed to a heavy rainfall, or snowfall, which is even more constant in its supply of moisture, melting very slowly in the spring. True, certain kinds grow admirably on our plains, like the Cedar of Lebanon and the Scotch Fir, but even European Pines often fail to thrive with us owing to a scanty rainfall, this misfortune never happening to trees of the forest plain, like Oak, Ash, Beech, and other trees, which have, so far, given the best results in English park, chase, and woodland. Therefore, in planting, trees of like character should never be forgotten, and many of the most beautiful of them, from America and Northern Asia, are far too rare with us, owing in part to the great space coniferous planting has taken up since the Wellingtonias and like trees were introduced.

ABELIAS.

THE Woodbine tribe, mainly from temperate or mountain regions, has enriched gardens with many plants such as Honeysuckles, Diervillas, Guelder Roses, and Abelia. The Abelias form a small group of some five or six kinds, all mountain plants, and natives of the hills of China and Japan, the uplands of India, and the mountain ridges of Mexico. Few of them are hardy in all parts of our country, though these that may be grown in the open air are beautiful and uncommon. In mild districts, with light soil, in sheltered corners on warm walls, they thrive in favoured parts. They do best and are hardiest in light, warm soils, enriched with peat or leaf-mould, and in spots well drained. Their pretty flowers are charming in drooping clusters, lasting long, and the good effect continued after their fall by the coloured sepals, which retain their beauty far into the autumn. They may be increased by layers in spring, or by cuttings under a handlight during summer. Two Chi-

nese forms known as *rupestris* and *uniflora* are not considered distinct at Kew, and are therefore united under the name of *A. chinensis*. The following kinds are in cultivation:—

ROCK ABELIA (*A. chinensis*).—This is a pretty and distinct shrub, usually of dense growth, reaching a height of 3 to 5 feet. It is the hardiest kind grown, and to do well needs a warm light soil and a sheltered spot. The flowers, about an inch long, are carried in clusters and are of a pale blush colour, fragrant, and



lasting for several weeks in early autumn. Even after the flowers drop the reddish sepals are still ornamental amongst the few late border flowers. China. There is a large-flowered variety of garden origin having larger and more numerous flowers, and greater vigour and hardiness. Syn. *A. rupestris*.

MEXICAN ABELIA (*A. floribunda*).—This beautiful shrub is the finest of the group, but save in mild parts must be grown under glass; even in the south it is best as a wall shrub, when its evergreen leaves and drooping flowers are well seen. The flowers, coming in March and April as drooping clusters from every joint, are

of a bright rose or rosy-purple, about 2 inches long, and hang for many weeks upon the plant. It does best in light soil, and when grown in pots should be kept rather close at the root. It is found in the mountains of Mexico, up to a height of 10,000 feet.

DWARF ABELIA (*A. serrata*).—This species is found as a low evergreen bush upon dry and sunny hillsides in China and Japan. It is smaller in all its parts than the other Chinese species, growing little more than 3 feet high, with solitary pale red flowers, which are large and sweet, appearing in March. A choice evergreen, but tender.

TWIN-FLOWERING ABELIA (*A. spathulata*).—An elegant plant not long introduced to gardens from Japan, where it is an evergreen shrub flowering in April. It is free with white flowers, marked with yellow in the tube, coming in pairs from every joint and about an inch long. The leaves are rather long, finely toothed, with a pale purplish edging.

INDIAN ABELIA (*A. triflora*).—This pretty shrub is less hardy than the Chinese forms, needing the shelter of a wall; being of robust growth, it soon makes a fine object, of good habit and branching freely. The flowers, coming in threes at the end of summer, are cream or pale yellow flushed with pink, their beauty enhanced by the rosy colour of the unopened buds. Grown in pots or tubs it forms a fine plant for the greenhouse where it may not be grown in the open. It is the only kind from Hindostan, being found as a tall shrub or low tree upon the hills of Northern India at a height of several thousand feet.

NURSES FOR TREES.—With good nursing almost any trees may be made to grow anywhere. Without it there are hundreds of places where it is hopeless to grow rare Pines or Oaks, for instance. Whatever does best in the neighbourhood—whether it be Larch, Spruce, Scotch Fir, Birch, or even Broom—that is the best plant to use for nursing and sheltering the trees or shrubs we wish to grow. Plant trees at the distances we wish them to occupy, but plant the nurses everywhere. Let them fill all the intervening spaces, almost embracing the trees, without touching them. These nurses help the other trees to grow, just as ours taught us to walk. But the nurse is often allowed to grow over and smother the tree it was meant to help; and so there has been a rebound against the whole system of nursing, and we see trees set down in the open teeth of the wind. Is it, then, any wonder that they refuse to grow, or die?

NEWER AMERICAN TREE CARNATIONS.

THE Carnation in its various forms now takes a large place in gardens, and for winter bloom is perhaps better than any other flower, lasting longer than things needing greater heat. With a good selection of varieties it is possible to have them in flower from autumn until the border kinds are commencing to bloom, thus completing the season for Carnation lovers. There are distinct strains of winter-flowering Carnations peculiar to France, America, and our own country. Those raised in the south of France under the name *tige de fer* are familiar to southern visitors from their display upon every warm hillside from Cannes to San Remo. They are raised in vast quantities and planted in light soil, grown with ceaseless care during the scorching summer, and flower during autumn and winter, under glass or movable straw shelters. Of late years, however, their culture has become difficult from the many diseases to which they are subject, and though their flowers are known all over Europe, the plants themselves seldom succeed in a climate damper and duller than their own. The American growers have given special attention to really free-flowering winter sorts, for many kinds even of the Tree Carnations are not free in winter. Their best kinds are most valuable in this particular, though their standard of form, which aims at fringed and frilled petals, is opposed to the English ideal of smooth petals. Of recent years there have been many fine gains on both sides of the Atlantic, and Mr. Dutton of Bexley Heath has kindly sent notes upon the best new American seedlings.

The popularity of the Tree-Carnation is due to the marked progress that has been made by raisers of this plant within the past ten years. They have studied the needs of the ideal Carnation—length and stiffness of stem, colour, fragrance, freedom, and, most important, a perfect calyx in a flower of lasting qualities. In the best Tree Carnations of English and American growers this ideal has now been fairly reached, as in *Mrs. T. W. Lawson*, one of the most famous of the new American kinds. Beside this fine pink flower, other good kinds of recent introduction are *Madame Melba*, perhaps the finest light pink Carnation, of good form and stem, finest habit, and very free and continuous

in bloom; *Royalty*, a large petalled flower of silky texture, in a pleasing shade of rose-pink, and good in every other detail; *G. H. Crane*, a flower of brilliant scarlet and a great winter favourite, one of the best in this respect; *Queen Louise*, a pure white of the best form even from an English point of view, and a free flowering kind for growing in quantity; *Harry Fenn*, a clear bright crimson very large, fragrant, and with a fine stem; *Floriana*, in delicate coral pink, of good form and constitution, and really free in winter. These Mr. Dutton places in the front rank of American Carnations. Other varieties are *Stella*, a white flower pencilled with rose at the edges; *Mermaid*, a salmon pink, which has gained a good reputation; *Marquis*, a light pink with a long stem; *Apollo*, with large flowers of a brilliant scarlet; *Alba*, a good white of glistening purity, good in form and stem; and *Governor Roosevelt*, a useful kind of good form, in deep crimson of an intense shade. The largest American kind, *Prosperity*, is more curious than beautiful, its white petals mottled with pink being less pleasing than the self-colours.

CULTURE.—Tree Carnations can be had in flower nearly the year round, and if their ease of culture were a little better realised they would be grown yet more largely for winter bloom, when a temperature of 45 to 50 degrees is all that is needed to ensure a continual display of bloom; a little heat and good ventilation being the two essentials. Shading must be used from May onwards as the sun gains strength, but the plants should never be watered unless fairly dry. Disbudding should be done to secure stems 2 to 3 feet in length, for, as an experienced grower, I have found that useless buds and not length of stem soonest exhaust the plant. These are easily rooted from cuttings in heat, from January to March, gra-

dually hardened off, and grown on in a cold house with side and top ventilation. They should be stopped once, from two weeks to a month after they are rooted, and re-potted as soon as side-shoots break, never letting them get pot-bound. They should remain outside (or better still in a cold frame) from May till the end of August, and then be placed in their flowering quarters.

LIVE FENCING FOR WOODLAND.

AN immense amount of energy is devoted in our country to fencing, which is wholly avoided in some other lands. The attention lately given to the planting of cold and heavy very poor or wet



CARNATION, MRS. T. W. LAWSON.

lands, profitless for arable culture and often for good grass, makes the question a pressing one. Our way of keeping stock in the open air instead of in sheds, and the abundance of game destructive to young trees, makes fencing a necessity; to simplify it as far as may be and to make it enduring, is worth thinking about. The following, by one who has been much concerned with fencing in wooded country for some years, will, it is hoped, prove of interest to planters, and indeed to all concerned with the beauty of our country—one of its best possessions. For what fair land could endure the ugliness of fencing of barbed wire, as we hear of its use in South America and other countries where our handsome living fences are unknown? Some think and act

as if the iron and wire fence were the best—a serious error. The wood should fence itself, and there are no plants so good as those found in our woodland naturally, such as Quick and Sloe. Worst of all, iron and wire fences give no shelter, and nothing but ugliness and danger.

TO REDUCE THE EXTENT OF FENCING is one of the motives which should lead us to plant in more visible and natural masses. In the common way or ring, specimen, and spinney planting there is often more fence visible than plants. No mechanical fence that the wit of man can invent is half as simple, enduring, easy to keep up, or effective as a Quick hedge set on a turf bank. The cost of this should be less than that of the iron fence. Even when we are obliged in badly-infested places to use the iron fence to support barbed wire, we should always plant a Quick fence inside it at the same time, to provide for the future fencing of the wood. The only weak point about the Quick fence is that the plants are usually so small that it is expensive to protect them. In many places it would be an excellent thing to lay down an acre of Quick and let the plants get into a bushy state, and then, in forming our fence, we should only have to send the cart for stout bushes, which would at once form a fence. I know nothing in woodland work that would be more useful than such a store of Quick. We can buy small Quick everywhere, but it is difficult to get it really strong, and impossible to get the bushes a yard high and nearly as much through unless we grow it ourselves. About ten years ago I made a fence with old bushy Quick of this sort, planting it on the turf bank common in the district; the tough bushes were placed close together and formed a fence at once, but as there were large bullocks nearly always in the pasture on one side, it was thought best to slip a single line or the slender and waste tops from a Larch plantation through the bushes at 2 feet from the ground. The fence made itself at once, and no bullock ever got through or injured it. I went to look at it the other day and found the Larch tops still sound; the fence, however, has no further need of them. Thus the expense of fencing the Quick itself was wholly got rid of; a very important point if we think of the trouble taken in this way. But to carry out this plan it is essential to put out young Quick and let them grow 3 feet or more high, and the stouter the better.

They transplant easily and without risk at any time in autumn or winter.

In planting rough corners of fields running into or near a wood we may often simplify the fencing by taking a short or easy line, so that the fences within the line become useless, and if among these useless fences there is one of Quick which is not very old, it is often well to move the plants and form the new fence with them, cutting down the plants one-half their height. Having had occasion to move a bank and fence of not very old Quick, I levelled the bank and took the plants elsewhere for fencing. In the course of the following year the roots of the Quick left in the ground began to come up and make nice little plants, and in another year there was quite a strong line of Quick in the line of the old fence; these were easily transplanted when wanted.

THE BEST PLANTS TO USE.—There has been much talk of the Cherry Plum as a fence plant, but it is quite inferior to the Quick in toughness and endurance, and in every way. At first there may be a little quicker growth, but not in the end, as the Quick grows freely enough. I have much greater faith in some of the American Hawthorns, such as the Scarlet and Cockspur Thorns, which are well armed, tough, sturdy, and fine in colour in autumn. The difficulty is to get a stock of them, as nurserymen are not yet aware of their value, and they are mostly grown for pleasure grounds, and grafted. I have often bought them grafted, which means, of course, that the native Quick will in time kill the foreigner. I have used some thousands of the Sweet Briar, and with excellent effect. In one way it is better than the Quick, namely, that cattle will not touch it, and creatures of any kind give it a wide berth. A rough woodland fence made of this and Quick, or Cockspur Thorn, is the best possible protection against stock. Barbed wire is not half as fierce as old Sweet Briar, which is impassable to the boldest boy, even one who would laugh at the idea of barbed wire stopping him.

Where shelter for animals is desired the most beautiful and effective fences are of Holly, self-sown hedges, giving as good shelter about a field, as a shed. Such Hollies, though free enough almost anywhere, are finest in stoney, sandy, or open ground. Ivy, Sloe, and Bullace

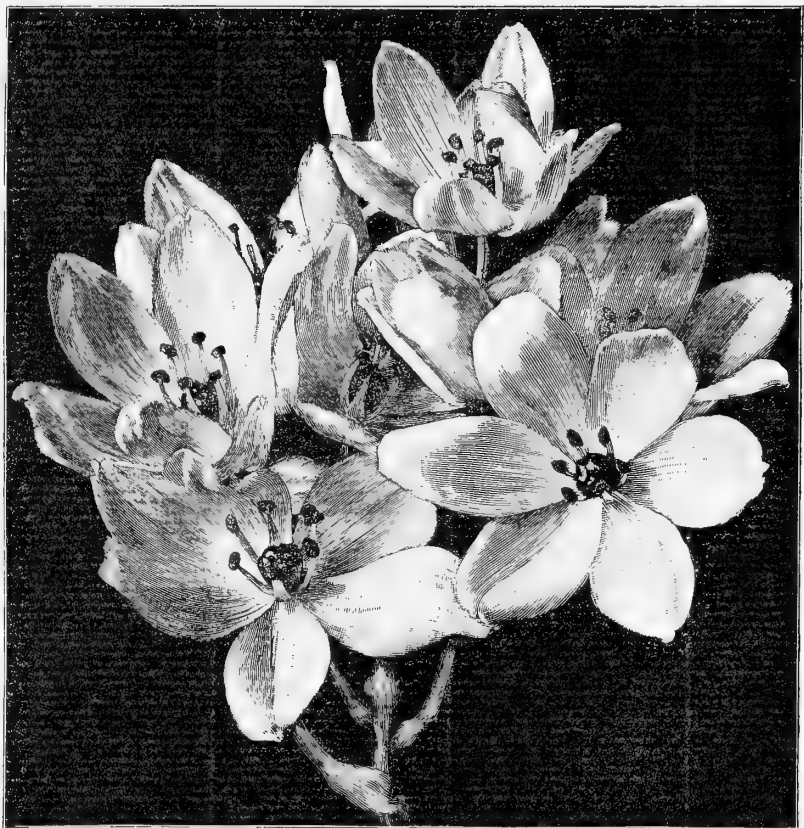
sometimes grow among them, and even make a very beautiful fence; but to enjoy a fence of that sort it is necessary to avoid trimming it every year, in the way which is usual in the midland counties and where land is precious. Let the woodland fence grow freely and only cut it down every ten years or so, and such bold fences are far better in their effect round woodland than small trim fences, while they may be more effective against any stock, and often as pretty as any garden with wreaths of Honey-suckle, Clematis, and Wild Rose.

* * *

THE ARABIAN STAR-FLOWER (*Ornithogalum arabicum*).

THIS fine plant of the Mediterranean region is one of the most beautiful of the many kinds of *Ornithogalum*, but is little grown, and not often well flowered. In the few places in which it does well in the open, the soil is warm and well drained, such as sandy shales overlying gravel, and liable to drought in summer. A time of complete rest is needed for its successful culture. Accustomed to the rainless summers of the Mediterranean shore region, from the time of its flowering in June until far into the autumn its bulb is exposed to a heat which, in any open spot, dries the soil like ashes for several feet in depth. In our gardens, therefore, we have to reproduce the same conditions as far as may be by other means. Not only must a dry and sunny spot be chosen, but, if grown in the open ground, it should be a place apart, where watering can be avoided, and the dormant crowns sheltered from heavy rains by a hand-glass or some such protection. When flowered in pots the same purpose may be served by a cold frame placed in the hottest spot available, where not only the Star-flower, but the more tender Anemones, Freesias, the Italian Scillas, and many other bulbs, might be left to bake in full sunshine and be all the better for it. Among southern growers it is a common practice, where the soil is at all cold or heavy, to take the plants

up as soon as the leaves wither and leave them exposed to the air, and often in the full sun, throughout the summer; in some cases they are even kept out of the ground for an entire season, and though this is attended with some loss the "rested" bulbs are sold at a higher price than those fresh lifted, and regain their size and firmness when planted. But even when undisturbed, in the open ground the arrest of growth is absolute, the withered leaves crumbling to powder. Not only did our Star-flowers bloom profusely each season, but never moreso than when, through incidental changes, they were left in a heap for many weeks, fully exposed to the sun. Those who have hitherto failed in getting a good result with this beautiful plant will be wise to adopt some such device for the complete ripening of the fleshy bulbs,



which, failing this, often lie dormant or nearly so for several seasons. In such a year as the present, when the ground has had no chance to get either warm or dry, the best hope is to lift the bulbs at the close of the flowering season in early summer, and dry them thoroughly on a shelf in the greenhouse, keeping them warm and dry till planting time in the following spring.
B.

PROFESSOR TRELEASE ON YUCCA.

(Continued from page 254.)

Y. Louisianensis (Trelease).—The aspect of the preceding, or, when the inner leaves are dilated, of *Y. filamentosa media*. The flaccid green leaves from less than half to (rarely) as much as $1\frac{1}{2}$ inches wide, white bordered, sparingly filiferous. Inflorescence an exserted glabrous or mostly pubescent panicle. Petals broad to attenuate. Style variously tumid and deep green, to pale and oblong. Capsule stout and short, angular in developing, as in *Y. flaccida*; where this has been long cultivated with *Y. rupicola* spontaneous hybrids occur, with the leaf margins neither denticulate or filiferous.

Y. rigida (Engelmann). — Caulescent, reaching 10 to 15 feet, simple or elongately few branched above. Leaves glaucous, thin but rather rigidly spreading, about an inch wide, mostly concave, often with scabrid ridges, slender tipped but very pungent, the yellow margin minutely denticulate. Inflorescence rather large, paniced close to the branches glabrous. Flowers not very large. Capsule oblong, thick-walled, rough, not constricted, the flat valves tipped with short outturned points: seeds very dull. South of Torreon, along the Mexican central railroad this small tree is abundant, on the rocky hillsides, and conspicuously contrasted with accompanying *Y. Trecaleana* by its very glaucous narrower foliage. It may be that small trees, visible from the Mexican national railroad, extend its range to the east. It is one of the handsomest tree Yuccas in its foliage; the slender trunks are commonly simple, but occasionally once or more forked.

Y. rupicola (Scheele). — Acaulescent. Leaves glaucous, pungent, firm or flaccidly spreading, often twisted, 1 to nearly 2 feet long and an inch or more wide, the yellowish, finely denticulate margin soon turning brown. Inflorescence glabrous, paniced mostly above the leaves. Flowers white or greenish: style white or greenish, oblong, often three-sided. Capsule thin walled, with flat or concave mucronate valves: seeds rather dull. From south-central Texas south-westward, probably across the boundary. One of the early discoveries of Lindheimer and Trécul, sufficiently distinct from all its congeners.

Y. rostrata (Engelmann).—Of the aspect of *Y. radiosa*. Caulescent, at length 9 or 10 feet high, or short-branched at the crown. Leaves very numerous, rigidly divergent, one-third of an inch wide, a little glaucous, flat or biconvex, straight, thin, very pungent, the yellow margin minutely denticulate. Inflorescence ample, with sub-included base or mostly exserted, glabrous. Flowers white, umbonate at base: style white, attenuate. Capsule oblong-ovoid, thick-walled, with convex valves long-attenuate and spreading above: seeds rather dull. Northern Mexico. It is loosely rooted in the soil, so that large plants are easily removed. The trunks vary in height from about 1 to 10 feet, the usual height being about 6 feet, and the wood is extremely soft and spongy. When the old leaves are removed, the diameter of the stem is usually 6 or 8 inches, and it is not dilated except where the roots start from the base; of somewhat the aspect of *Y. radiosa*, but with more rigid and denticulate not filiferous leaves, this species rivals in gracefulness of habit the *Nolinas* of Mexico and the Grass-trees (*Xanthorrhæa*) of the South Sea, both of which it far surpasses in beauty of inflorescence, and it should prove a desirable addition to regions like California, Madeira, and the Mediterranean countries, where it will prove hardy.

Y. gigantea (Lemaire).—A rough-barked branching tree 30 feet or more high. Leaves rigidly spreading or somewhat flexuous, green, glossy, plicate, with soft green tip, over 3 feet long and often 3 inches wide, scabrid margined. Inflorescence compact, close to the leaves. Flowers resembling those of *Y. gloriosa*. Fruit apparently soon drying. This species, if more than a form of *Y. elephantipes*, was first described from young specimens cultivated in European gardens, and again, in mature form, from a large tree cultivated in the Azores. It is not known in a state of nature. In habit and foliage, except for larger dimensions, it resembles *Y. elephantipes* and is probably a form of it.

Y. gloriosa (Linnæus).—Shortly caulescent and cespitose, or the trunk high and with several branches. Leaves slightly glaucous when young, smooth or the dorsal lines roughened, rather thin, but rigid, often concave near the inrolled pungent, usually dark apex, about 18 inches wide, the usually brown margin at first with a very few rarely persistent minute teeth,

when developed entire or occasionally with a few slender fibres. Inflorescence mostly narrowly paniculate, the base often not exerted, glabrous or exceptionally puberulent. Flowers creamy white, often tinged with red or violet: ovary often with a slight suggestion of basal stipe; style oblong, white, frequently three-divided. Fruit obovoid-oblong, mostly pendent, with six prominent ridges, the thin exocarp soon drying about the core; seeds glossy, slightly grooved as if the albumen were ruminated. Coast and "sea islands," from South Carolina to north-eastern Florida, on the sand dunes. Generally planted and in places escaping, in the eastern Gulf region. The typical form and a variety *plicata* are the only known spontaneous forms of this species. It has been in cultivation since 1596, and to-day is represented by a number of garden forms, several of them hardly further north than any other species except *Ys. flaccida*, *filamentosa*, and *glauca*. Some of these approach the following two species while others are but tentatively placed anywhere; a number of imperfectly described garden hybrids add to the difficulty of properly understanding *Y. gloriosa*.

Varieties: *minor*, a garden form smaller in every way; *obliqua*, a form with glaucous leaves somewhat twisted to one side; *medio-striata*, a garden sport with a median whitish stripe on the leaves; *robusta*, intermediate between *Ys. gloriosa* and *recurvifolia*, with the outermost of the slightly plicate leaves somewhat stiffly recurved; *nobilis*, leaves scarcely plicate, glaucous, the outer recurved, sometimes twisted to one side—it is an intermediate form differing from the preceding in its more persistently glaucous leaves; *longifolia*, scarcely differs from var. *nobilis* except in its young leaves being narrower, though in age they are said to reach a width of 3 inches; *plicata* differs from the type in having the more permanently glaucous, shorter and hence relatively broader concave leaves evidently plicate towards the apex—found in the "Sea islands" of Georgia and South Carolina; *superba*, a cultivated form of the above, becoming 8 or 12 feet high, with greener leaves; *maculata*, a low garden form, with the plicate dark green leaves persistently roughened on the margin, the varietal name referring to a mottled variation of the usual red tinging of the flowers.

Y. recurvifolia (Salisbury).—Shortly caulescent, branching. Leaves at first somewhat glaucous, nearly plane, long, flexible, recurved, about 2 inches wide, often slightly plicate above, narrowly yellow or brown margined, often with a very few microscopic teeth, at length entire or slightly filiferous. Panicle narrow, the scape often included. Styles shouldered. Fruit erect, oblong, with six winged ribs mostly infolded over the nectarial grooves; seeds rather dull, the surface less grooved. "Sea islands" and adjacent coast of Georgia. This species has been in cultivation since 1794, and is represented by many garden varieties:—*rufocincta*, a low form with rather pronounced accentuation of the reddish-brown margin; *marginata*, leaves bordered with yellow, and often with a rose tint. Gardens:—*variegata*, a garden sport with median yellow stripe; *elegans* differs in having the median stripe reddish.

Y. flexilis (Carrière).—Shortly caulescent. Leaves most transiently glaucous, nearly plane, long, narrow, little if at all plicate, occasionally a little persistently denticulate or filiferous, flexible, at least the outer recurved. Panicle loose, exerted on a long scape. Style somewhat shouldered. Fruit unknown. A many-formed plant, apparently known only in gardens where it often passes for *Y. gloriosa*.

Varieties: *Peacockii*, scarcely appears to differ except in the leaves being stricter; *ensifolia* is taller, 3 to 4½ feet, with less recurving, soon pale green, somewhat concave entire leaves; *Hildrethi* differs from *ensifolia* chiefly in having its somewhat falcate leaves usually finely filiferous in age; St. Augustine, Florida, where it is said to bloom throughout the winter: *tortulata* differs from *ensifolia* chiefly in being shorter-stemmed and with its green leaves flatter and somewhat falcate, and from *Y. gloriosa minor* in its longer outer leaves being reflexed: *semi-cylindrica* differs from *ensifolia* in its firm and deeply concave narrower leaves, less than three-quarters of an inch wide: *Boerhaavii* is distinct from the preceding in its flat scarcely pungent leaves: *patens*, a garden form, said to have come from China, with less arched glaucous slightly rough-margined leaves, approaching some of the forms of *Y. gloriosa*.

Y. De Smetiana (Baker).—Caulescent, at length with a trunk 6 or 8 feet high. Leaves

rigid, evenly and stiffly recurved, becoming 1 foot long and an inch or more wide, purple tinged, entire or slightly rough-margined at base, not pungent. Flowers and fruit unknown. A garden plant ascribed to Mexico, which when small is suggestive in appearance of a lily because of its crowded arching, not at all concave leaves; quite unlike any other *Yucca*, and perhaps not of this genus. No record exists of the source of the plants of this species cultivated at the Missouri Botanical Garden, but they are believed to have come from Northern Mexico, many years ago.

Y. aloifolia (Linnaeus).—Is a low slender tree, somewhat short-branched above and often cespitosely suckering. Leaves flat, rather thick, rigid, denticulate on the margin, very pungently brown-pointed. Inflorescence usually close to the leaves, compactly paniced. Flowers creamy, tinged with green or purple toward the base; ovary shortly stipitate; style short, not contracted, oblong or a little tumid, abruptly starting from the ovary. Fruit oblong-prismatic, nearly black, coreless, with dark purple pulp; seeds glossy, round or oval, often acute at one end. Virgin Isles, Jamaica, eastern coast of Mexico, the Bermudas, Atlantic and Gulf States southward; and occasionally escaping from cultivation as far inland as Louisiana. The principal forms of this species, which has been cultivated in Europe since 1605 and which differs from all other *Yuccas* in its stipitate ovary and coreless purple-pulped fruit, commonly formed without *Pronuba* aid, may be distinguished as follows:—*purpurea*, a purplish-leaved garden form, perhaps more properly placed under var. *arcuata*: *marginata*, a garden form with the leaves green at centre, bordered and striped with various shades of yellow and white, and often tinged with red at least when young. No doubt separable into at least three forms capable of being fixed by selection:—one with yellow margin, one with added white stripes, and one with a fairly persistent additional line of red on the back near the border: *tricolor*, a garden sport of the preceding with a median yellow or white band bordered with green, and tinged with red when young. Neither of these variegated forms come true to seed, and the intensity of the variegation, particularly the red, is apt to change with age and season: *arcuata*, is short-stemmed from a

prostrate caudex. Leaves less than an inch wide, 1 to 2 feet long, smooth, the margins less denticulate than usual. A garden form doubtless derived from the Carolina coast region: *Draconis*, with trunk branching above, rather tall, leaves broad and long, more flexible and somewhat arched, less pungent. As far as it is known to me *Y. Draconis* is properly placed under *Y. aloifolia*, with the differential characters given. It appears to have been cultivated in Europe since 1605, but it is not impossible that much of the earlier *Draconis*, like that of gardens to-day, was *Y. elephantipes*, the fruit and flower characters of which are quite different from those of *Y. aloifolia*, though the foliage is of the same general type: *conspicua*, with trunks clustered, leaves broad and lax, recurving, softly green pointed. A form of the preceding, frequent in European gardens and said by Baker to be represented by wild plants from the Pacific slope of Mexico: *tenuifolia*, resembles var. *arcuata* in habit, the leaves frequently falcate, often purplish with somewhat roughened dorsal ridges and very sharp but fine marginal toothing. A cultivated form, doubtless of the coast region, and found by the writer escaped along the shady roadside at Vicksburg, Mississippi. *Menandi*, a sport, seemingly of *f. tricolor*, with the rigidly, much-recurved leaves about 1 foot long, one quarter to half an inch wide, somewhat rough on both margin and dorsal ridges, of a deep green, with yellow and occasionally red median band or lines narrow on the upper surface but, as in form *tricolor*, occupying a large part of the lower surface. Purchased under the name *Y. quadricolor*. *Yucatan*, trunks clustered from the base, as much as 20 feet high. Leaves rather flexible. Inflorescence tomentose. Stamens shorter than in the type. Yucatan. From all of the other baccate *Yuccas*, *Y. aloifolia*, in the comprehensive sense, differs obviously in its evidently stalked ovary and coreless purple-fleshed fruit. Its geographical distribution leads to the conclusion that it may have originated in the eastern islands of the West Indian group, spreading, by aid of ocean currents, to the Atlantic states and Bermudas, and, by way of Jamaica, to the Mexican coast, isolation on the peninsula of Yucatan having given rise to the marked variety named after that country. W. T.

(To be continued.)

FLORA

AND SYLVA.

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DECEMBER, 1903.

[Monthly.

MAST OR BRUSHWOOD ?

THERE is a mistake running through the whole of our planting, which does infinite harm from an artistic and even a cultural point of view, and which is as difficult to eradicate as Twitch or Bishopsweed. It is the common way of insisting that every precious tree we have should be planted as an isolated specimen on the grass. The other day in an interesting garden I saw a noble Monterey Pine (*P. insignis*), a tree about seventy years old and in perfect health, but instead of a stem such as a great Pine ought to show, its branches were massed close to the ground like a huge bush and one could scarcely get under them. Thus the tree afforded an immense leverage for rain, or wind, or (worse than all) that wind-carried sleet which is so often harmful to such trees. It grew in grass as usual, and that it thrived in the climate of the district was clear from its healthy foliage; but the timber was very much less than it would have been if the tree had been planted rightly, for, instead of being (as in a forest Pine) massed in the stem, it was wasted in twenty great arms. In this way of planting, trees like the Scotch Fir, the Cedar of Lebanon,

and the Monterey Pine, grow too much to branches, not losing their lower limbs but pushing them out until they become the enemies of the main stem. Hence it is we have so many trees thrown down by storms, apart from other evil results of the practice. Other Pines, like the Columbian Fir (*Abies nobilis*), never assume this bushy habit, but go up like arrows, their lower branches getting weaker as the tree grows higher; massed together, as in Nature, they lose them quicker. When the bare stem is seen in such trees many, who have not seen the trees in their native home, complain as to their loss of health, whereas they are merely throwing off tired branches for which they have no further need. In the case of nearly all forest trees, and the Pines more than any, it is a distinct gain in beauty to show the stem. The column or stemmed trees escape the wind, and do not suffer from exposure or from being set on grass, which during summers of light rainfall takes all the moisture. In Nature they shelter each other, and the mast-like stems are sufficient to uphold them in any storm. What is the remedy for the mistake so often made in their planting? Certainly grouping

the trees closer together, and so gaining those stately columns, good effect, and timber if we want it. If there is not room to group each kind of tree separately there is no reason why different Pines should not be grouped together. Much of the time and energy of writers and students is wasted in the attempt to draw distinctions where none exist, and from the abysmal profundities of Kant to the last issue of some publications dealing with the simple facts of country life this needless confusion exists. Attempts are made to set up distinctions in kind where it is only a question of degree. We have the hen to eat and the exhibition hen, which proved so distressing a bird to Sir Henry Thompson; we have men endeavouring to separate garden from exhibition Roses; critics who write of all sorts of "schools" in art instead of showing the harmony with Nature of all true work in art; and now books of woodcraft show the same mistaken tendency, and instead of making writings about wood work simple and clear, a jargon of German and bad English is used to make them as obscure, pedantic, and learned-looking as possible. The tree growing by itself, as our English trees often do, is discussed on "arboricultural principles"; trees growing over the fence in the wood are grown under another set of principles called "sylvicultural." This and much like talk is very apt to confuse. Some of the noblest trees for beauty as well as size are in the forests, and I would much rather have Oaks from the forest of Marly or Bercy in the pleasure-garden than any merely bushy tree usu-

ally grown therein. All this tall talk simply means that the greater trees of the northern forest should be grown as they are found in natural forests generally; *i.e.*, close enough together to get the true form and stature of the central stem. * * *

CESTRUM (CLUSTER FLOWER).

SOME half-century ago many of these beautiful South American shrubs came first to this country, and were for a while much grown, but the desire for soft-wooded and hardy plants has in a measure ousted them from gardens. As wall or pillar shrubs they are handsome, easy to grow, and free in flower at a time when flowers are getting scarce, so that where room can be spared, the best of them are quite worth a place under glass; but being strong growers, whether planted out or grown in pots, they must have room in which to develop. Their pendant branches, bearing heavy clusters of flowers, are brilliant and graceful, their colour ranging from white and orange to crimson, purple, scarlet, or blue. As pot plants they may be grown in the open during summer and early autumn, and in mild districts some of them may be planted out against a sheltered wall, or the columns of a sunny verandah; but they are best as pot plants, or grown in a good greenhouse or conservatory border, where they can receive abundant air and sun during summer, ample root space, and a genial winter temperature. When fully grown they should be well cut back each spring, as soon as growth begins; strong new shoots from beneath are thus encouraged to replace the old wood, which never flowers well a second time. Being gross feeders they should be topdressed and richly fed when in active growth, lessening supplies towards autumn, when the growths ripen and the flowers appear. On the Riviera (where they are best known under their old name of *Habrothamnus*) they form beautiful bushes reaching 12 to 15 feet in height, and flowering in the greatest profusion, the flowers coming in the autumn in great tassels from the end of every shoot, beneath which the stems are weighed down; and again in spring, when smaller clusters appear from every joint and side-shoot. In many cases

the flowers are followed by berries of crimson, white, or blue. Any light rich soil suits them, but there must be free drainage. The *Cestrum*s may be raised from seed, but are best grown from cuttings of young wood, rooted in heat during early spring, or of ripened shoots rooted under a hand-glass in August; the young plants should be well treated, for once starved they are long to recover. A good plan when small neat plants are wanted for winter bloom is to strike cuttings early, grow them on briskly until June, then plant out in good soil and a sunny spot. Stop them from time to time during summer and, at the end of September, pot them up and place in a greenhouse, where they finish their growth, and on coming into flower make bright little bushes for the house or the conservatory. The following kinds are known in gardens:—

C. alaternoides.—A low-growing shrub from the West Indies, bearing in summer inconspicuous white flowers in short sessile racemes. A stove evergreen, with leaves tough and glossy.

GOLDEN CLUSTER FLOWER (*C. aurantiacum*).—A handsome greenhouse shrub, of slender upright growth and spreading habit. It is less vigorous and hardy than most of the *Cestrum*s, rarely growing more than 4 to 5 feet high, with dark grey or brownish stems and smooth, bright green leaves. The tubular flowers, coming in August, are of a bright, clear orange, sweetly scented, and borne in upright clusters at the ends of the shoots, succeeded by small white berries. Guatemala.

C. corymbosum.—A very handsome greenhouse evergreen climber of robust growth, with large smooth leaves upon gracefully pendant branches, bearing at their tips during summer massive bunches of flowers, rich crimson or scarlet in colour, and of great beauty.

WHITE CLUSTER FLOWER (*C. diurnum*).—A shrub of large growth, and smooth pale green leaves, bearing in late autumn clusters of small white flowers, exceedingly fragrant during the day. Stove. Cuba.

CRIMSON CLUSTER FLOWER (*C. elegans*).—The best-known kind; a rapid growing shrub of graceful weeping habit, with leaves soft and

hairy, and the young shoots covered with purplish down. The flowers, borne in dense heads, are of a rich crimson or purplish-red, followed by large shining berries of a pale reddish-violet. The long hanging sprays are beautiful when cut, but droop rather quickly. It is a good plant for pillars, or the back wall of the conservatory, if not too much shaded. Mexico; where it



SCARLET CLUSTER FLOWER.

abounds in the forests at a height of 3,000 to 5,000 feet. *C. argentea* is a greenhouse form, the leaves of which are marked with rose, green, and white, in a rather pretty manner.

SCARLET CLUSTER FLOWER (*C. fasciculatum*).—Another Mexican species of more upright habit, stems long and slender, bearing leaves large, broad, and downy, with an un-

pleasant smell. The flowers are showy, coming during winter, and bright scarlet or orange-red in colour; at first nearly upright, but becoming pendulous as the cluster expands fully.

MORTOLA CLUSTER FLOWER (*C. Mortolensis*).—A garden hybrid between *elegans* and *fasciculatum*, carrying distinct flowers of a bright clear rose. La Mortola, Italy.

NEWELL'S CLUSTER FLOWER (*C. Newelli*).—A garden hybrid, good in colour and in growth. It forms a shrub some 6 feet high, with small neat leaves, quite smooth, upon light and graceful shoots. The dense rounded clusters, borne with great freedom, are of a bright clear crimson.

FRAGRANT CLUSTER FLOWER (*C. nocturnum*).—A rather dingy plant from the West Indies, with long slender flowers of yellowish green, very fragrant towards evening and throughout the night.

HARDY CLUSTER FLOWER (*C. Parqui*).—A very old greenhouse plant, found in many forms all over South America, but common in the Chilian Andes. In mild districts it will grow out of doors, if given a sheltered wall and some protection. It reaches 5 to 8 feet high, with long narrow leaves of fœtid odour, and funnel-shaped flowers of whitish-green or dull yellow, sweet at night with a delicate fragrance as of Jasmine. The flowers, coming during summer, are followed by small round black berries.

HAIRY CLUSTER FLOWER (*C. tomentosus*).—Another Mexican kind, densely hairy in all its parts, but otherwise not remarkable.

PURPLE CLUSTER FLOWER (*C. vespertinum*).—A downy shrub, bearing oblong leaves and flowers of a dull purple in early summer, giving place to bunches of blue berries.

BLUE CLUSTER FLOWER (*C. Warscewiczii*).—A stout branched shrub, softer in all its tissues, with large velvety leaves; in habit and aspect akin to the *Ioichromas*, with which it is sometimes classed. Its flowers, borne in drooping clusters, are blight blue, very showy and distinct. It comes readily from seed. Peru.

ERRATA.—Two slight errors found place upon p. 230. The botanical name of the French Willow should read *Epilobium angustifolium*; while the pretty little Toad-flax, to which reference is made in the same article, is inadvertently mis-called the Common Flax.

THE GREATER TREES OF THE NORTHERN FOREST: No. 9. THE NORWAY SPRUCE (*Picea excelsa*).

ONE of the great trees of the Northern Forest, and perhaps producing as large an amount of useful timber as any other tree, imported in vast quantities into our country and others. It is so common in many parts of our islands that the term Common Spruce is applied to it; and yet it is not like the Scotch Fir and the Cedar of Lebanon, careless of soil and situation, since over a large area in southern and midland England and elsewhere if the soil be dry, chalky, poor, or sandy, it is a failure. It may survive the nursery stage, and people go on planting it regardless of conditions, but about the time when it ought to be something like a tree it is sickly, rusty, and useless. In parts of the country, such as the highlands of Scotland and hills of Ireland, on the west coast, and in the western counties where there is a copious rainfall, this state of things does not obtain. In such districts fine trees, of beautiful regular colour and growth, may be seen. Precious, therefore, as this tree is in many places, it must never be planted save where the soil is constantly cool, or on low flats near streams.

Like every other Pine of wide distribution and much cultivated in gardens, it is broken into a number of dwarf, distorted, snaky-branched, variegated, and other ridiculous varieties, not one of them of the slightest value from the forest point of view, or even for beauty. Books (and even good books) tell us that the only "ornamental" form for the Spruce is as a completely furnished

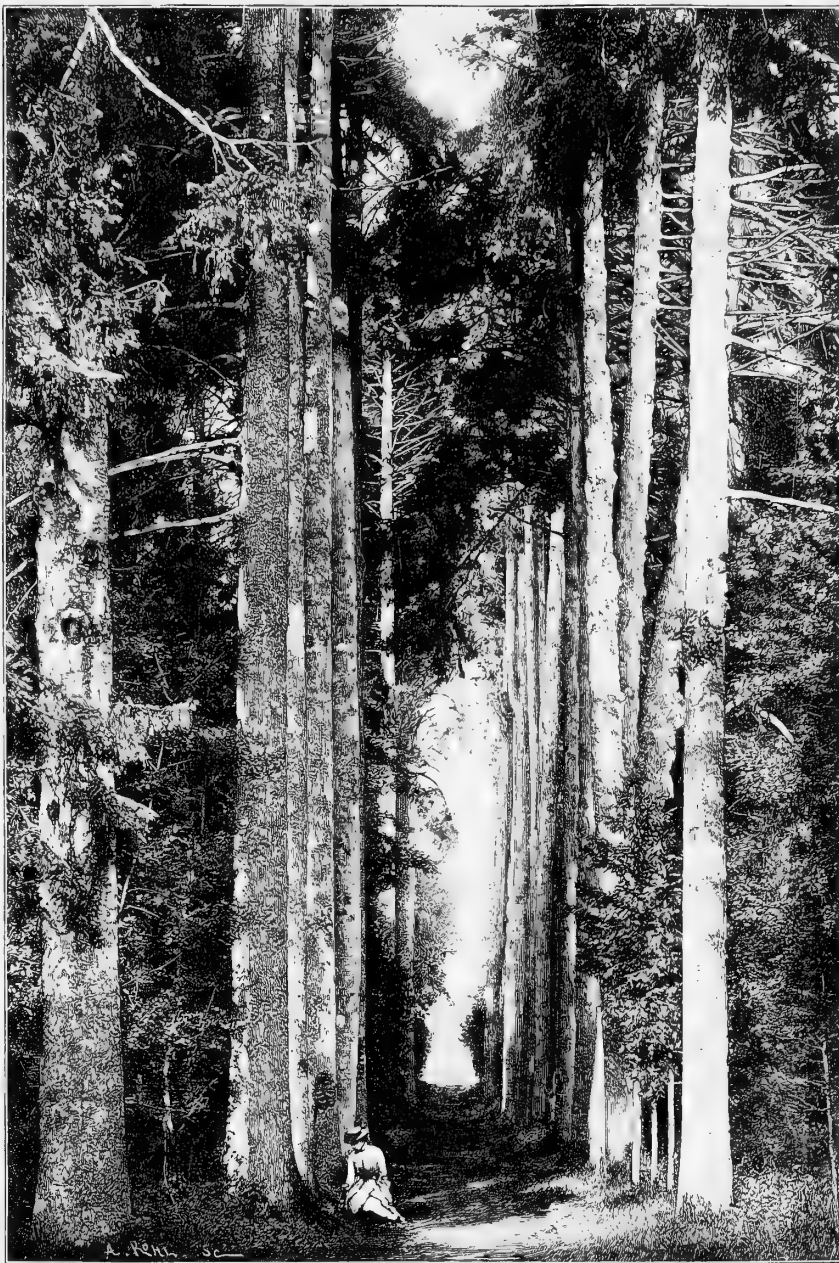
tree, branched from top to bottom. It is beautiful in that as in all ways, but, like most conifers, it is best seen in its true forest form with a tall mast-like stem, and in our illustration its effect is shown in that way. There

are chances, however, of enjoying it in both ways, as at the edges of the wood or in isolated groups, when it keeps its branches long. All visitors to Oakley Park, Cirencester, agree that one of its finest features is the avenue of Firs, known as the "Cathedral Firs," and there is no mistaking the remarkable effect of their stems. The avenue is about 150 yards long and 50 yards wide, and many of the trees are 110 feet or more high; one of the largest, which was blown down some years ago, was found to be 120 feet in length. In a young state the Spruce grows rapidly, but those at Oakley Park are very old. They are known to be not less than 110 years old, and are thought to be much older. The oldest inhabitants of the district remember them well for upwards

of seventy years, and state that they fail to see any marked change in their appearance during that time. On Lord Bathurst's estate there are other fine avenues, one being of forest trees six miles in length, while another is com-

posed entirely of English yews from 800 to 1,000 years old.

The natural area of the Spruce is most irregular, showing the least development on the south-west, from



THE NORWAY SPRUCE AT OAKLEY PARK.

whence it widens over central Europe in a north-easterly direction, extending from the Maritime Alps on the one hand to the Arctic Zone. In northern regions, as in Norway, the Spruce comes down to the sea coast, and is rarely

found at a greater height than 650 feet. Southward this altitude increases, but with a perceptible lowering towards the west, where conditions are less favourable to its growth than on the eastern slopes of the Alps. Thus in the Tyrol it is found at a height of 6,500 feet and in the Engadine even higher, but as it ascends it quits the plains and valleys, and is not found growing spontaneously below a limit of about 1,900 feet in the Vosges and Jura, and 2,500 in the Maritime Alps. In France, indeed, it exists only as a tree of the mountains, with a range higher than that of the Fir. The Spruce, planted alone, or along with the Scotch Fir and Larch, forms vast forests in the eastern and northern portions of its area.

The Spruce is not exacting as to soil but it must be moist, or even wet; peat, while not favourable, is not really harmful. In a dry soil it may exist but only in a degraded condition, with yellow or rusty coloured foliage instead of its natural dark green. The needles also are short, its cones unnaturally abundant, and its growth much below that of the normal tree. Its first essential is a moisture-laden atmosphere, frequent rains, and heavy dews, which maintain the cool surface necessary to its feeble roots. It loves the light and has none of the Silver Fir's tolerance of shade, disappearing if kept too long under cover of other trees. In mixed woods of Fir and Spruce one may often see the Silver Fir growing well under cover of the Spruce, but never the Spruce under the Fir, except in a dwindling state.

Its wood, known as "white deal," is the object of a vast trade throughout northern Europe, enormous quantities being shipped to this country. It is distinguished from that of the common Fir by its lighter and softer tissues, its distinct grain and smell, and its colour—in general paler than Pine-wood. The timber grown in this country is usually softer and less valuable than that of northern Europe, but there is no reason to doubt that on our cold mountain lands in Wales and the north it would in time produce timber as good as any other country, if grown in the true forest way. * * *

A WILLOW-SHADED WILD GARDEN.

THE beauty of a wood of Willows is remarkable, and quite distinct from that of any other wood. The feathery character of the foliage never admitting of any deep shading, produces a beautiful and diffused light over the whole wood. The undergrowth of plants flourish in this light, and a wood of Willows is therefore a good home for moisture-loving plants and bushes, like the tall Water Iris, Sweet Alders, hardy Azaleas, Bamboos, Royal Ferns, Feather Ferns, giant and other Meadowsweets, giant Poppies, Knotworts (*Polygonum*), tall Meadow Rues, and many beautiful plants too vigorous for the garden but which could be seen at their best in the gentle shade of a Willow bottom. This kind of wild gardening may be done without in the least reducing the value of the Willow patch for the growth of timber. The undergrowth of these

vigorous hardy plants is not a more severe task for the soil than the growth of wood plants (which often occurs naturally in the wood), which means that we can enjoy a beautiful wild garden in the gentle shade of Tree Willows far better than if we specially make one. The very soil that accumulates in the bottoms is the best we could have for many of the stouter herbaceous plants and the nobler ferns and marsh bushes. In districts where there is too much sunshine for the Rhododendron to thrive the hardier Himalayan and other good kinds would often find the shade and soil they seek beneath the Willows. A simple rough path running through the drier and prettier parts would do the rest. What has been before said of the Red-wood Willow, as regards the value of its shade for one phase of the wild garden, applies to other Tree Willows as well—the great White Willow, the Red (or Cardinal) Willow, the Yellow Willow, and to their beautiful weeping varieties, of which the best I know among new trees is the Yellow *Weeping* Willow. I have trees of them, both grafted and on the natural roots, the own root trees very much the best in form, in leaf, and in their thriving. There are also graceful Willows of garden origin which are worth owning for their own sakes; but by far the most stately and the best are the White Willow, the Red Willow, and the Weeping Yellow Willow (*Salix vitellina pendula*).

We have proof in many places, as in the woods near Hatfield, that some Willows are true forest trees, though, from their being casually planted and

frequently pollarded, this is not so clear to all. Unfortunately, also, the facility of their increase leads to their being propagated in a way, as we think, less likely to develop their tree qualities. The cuttings strike so easily that they are always increased in that way. If we merely want switches or poles this may do, but when we want the tree to attain its fullest size it is a different matter, and all planters of forest trees should try to raise the Tree Willows from seed. All those delicate seed-bearing parts were not made by Nature for nothing. In increasing trees by cuttings, &c., nurserymen are only stopped by trees that resent the indignity of such propagation. The remedy is in the hands of the planter, who should insist, where possible, on getting every tree for forest planting raised from seed.

MM. Vilmorin and Andrieux, Haage and Schmidt, and others of the great wholesale seed-houses of Europe, offer seed of these Tree Willows, so there should be no insuperable difficulty in getting a stock of Tree Willows from seed. It should be sown as soon after saving as possible, the seed being small and not living long out of the ground.

THE BAN-FORESTS OF THE ALPS.—“Every mountain village has ban-forests, if it is shut in by steep valley walls, and therefore exposed to avalanches, falls of stones, or land-slips. These ban-forests are kept up from motives of prudence. The office of the ban-forest is to hinder, by its mass of strong upright stems, the breaking loose and sliding down of the vast heaps of snow that accumulate in the winter, and thus to prevent the formation of ‘ground avalanches,’ not, as is commonly supposed, to hold up the avalanches already started, like a dam. The inhabitants of the Alps saw this necessity centuries ago, and spared particular forests, placing them under the ‘ban,’ i.e., declaring it unlawful to cut wood in them under heavy penalties.”—BERLEPSCH on *The Alps*.

THE CHEROKEE ROSE (*Rosa laevigata*) AND ITS FORMS.*

THIS lovely single Rose, introduced from China in 1759, has been naturalised in divers parts of the world, and has, probably owing to this fact, been known, since its first discovery, by a greater number of synonyms than any other member of the genus *Rosa*. The specific name of *laevigata* was given in 1803 by Michaux, who found it in Georgia, where it had been naturalised for some twenty years, and where it climbed to the tops of the loftiest trees. It has also been naturalised in the West Indies, in parts of India, and in other distant portions of the globe. Besides the name *laevigata*, this Rose has been known as *R. sinica*, which Mr. Nicholson, in his "Dictionary of Gardening," holds to be the correct specific title, and the Camellia Rose (*R. camelliæflora*), from the shape of its flowers. Owing to its wide distribution and naturalisation it is only to be expected that various seedling forms should have arisen, and of these the finest that I know is that of which a coloured representation appears in the current number. This plant was sent as a rooted cutting from Abbotabad in N.W. India to N. Baker, Esq., J.P., of Butt's Hill, Kingswear, S. Devon, about fourteen years ago. It was planted at the front of a house facing south-west and over-looking the mouth of the river Dart, and is entirely sheltered from the north and east winds by a steep, wood-crowned hill that rises immediately behind the house. Its conditions of site and climate are, without doubt, excep-

tionally favourable, and that they are appreciated by the Rose is shown by its perfect health and vigour. It is growing beneath a narrow balcony about 12 feet above ground level, which it has completely covered with its growths, and has ascended to the eaves of the house, a height of about 35 feet, while its greatest spread is fully 30 feet. The flowers are very large, averaging $5\frac{1}{2}$ inches in diameter, while I have measured blooms 6 inches across. They exhale a delicate ripe-pear fragrance. The plant usually attains the zenith of its display towards the end of May, and then, with some 300 fully expanded blossoms, presents a lovely picture. Its flowers are of such a size that it has often been mistaken for a large-flowered Clematis by visitors possessing but scant horticultural knowledge. Its floral display is largely dependent on the season. In some years it commences to flower in April, but in the present year few blooms opened before June, doubtless owing to the sunless summer of 1902, and the past ungenial spring, whilst a great falling off was apparent in the number of blossoms. Even when not in flower *R. laevigata* is attractive by reason of its shining, polished leafage, which is practically evergreen. Many cuttings of this Rose have been rooted, but the majority of those that have come under my notice have made but poor growth. When budded on the *R. polyantha* stock, however, it is quite a different matter, growth being exceptionally vigorous, shoots 12 feet in length being sometimes formed in a season. I have not measured any

* With coloured plate from a drawing made at Kingswear by H. G. Moon.

blooms produced on this stock, but from cursory observation I should judge that it had no dwarfing effect on the flowers. Lady Falmouth at Tregothnan, and Miss Willmott at Tresserve, both have plants on the *R. polyantha* stock, which, I believe are doing well and giving full satisfaction. In this note I have referred solely to the *R. lævigata* from India grown at Kingswear, and, from what I have seen of *R. sinica* or the Camellia Rose on the Riviera and in England, am under the impression that the type does not produce as large flowers as the Kingswear form. While I do not for a moment wish to advocate the culture of *R. lævigata* in the colder districts of England, I should certainly advise the trial of this most beautiful Rose on southern walls in the milder portions of our islands. The conditions which obtain in the Kingswear garden where the parent plant is established are admittedly rare, for there Mesembryanthemums remain unprotected through the winter, *Acacia dealbata* flowers profusely in February, and *Embothrium coccineum*, *Fremontia californica*, and *Cæsalpinia Gilliesi* are growing; but even in spots less favoured climatically the experiment may well be made, for plants often prove to possess far greater hardiness than they are credited with, and I was surprised the other day to find the Australian Bluebell Creeper (*Sollya heterophylla*), which I had considered very tender, growing vigorously and flowering profusely on high ground about two miles from Chepstow. *R. gigantea*, introduced in 1888, was brought out with a great flourish of trumpets, but although I have seen several plants in the open I have never

known one to flower, and imagine that even if it were floriferous it would not rival in beauty *R. lævigata* at its best.

S. W. FITZHERBERT.

Kingswear, South Devon.

ROSA LÆVIGATA, VAR. "ANEMONE ROSE."—Of this fine and new form of the Camellia Rose, Mr. S. Mottet has kindly sent us the following note:—A beautiful and as yet little-known variety of this plant has been grown now for some years. It is a form of obscure origin, but probably Japanese, distributed in 1896 by J. C. Schmidt, of Erfurt, under the name of *Anemonen Rose*, from its likeness to the rosy form of the Japanese Wind-flower. Though with the general aspect of the Cherokee Rose it differs from it so much in some ways as to suggest a hybrid form rather than a mere colour variation. Its stem, instead of being green and armed only with thorns, as in the type, is of a dark purple colour set both with thorns and small spines mingled; the calyx and flower-stems are also less fleshy in texture, and smoother in character. Its flowers are fully as large as in the older form, measuring nearly 4 inches across, with large petals slightly frilled and of a beautiful rose colour, which varies in intensity according to season and position. An additional merit is, that if not frankly "perpetual" its beauty is less fleeting than that of the Camellia Rose, for its flowers succeed one another well into the middle of the summer. In habit it is even more free and vigorous, and fully as hardy as the type, and is adapted to the same uses in covering walls, pillars, or trellis-work, but only in spots that are warm and sheltered. Grafted standard-

high upon the Briar, it quickly forms fine specimens, or as a Rose for the rock garden it is equally striking and beautiful. It is easily multiplied by cuttings or by grafting, the red and white forms being sometimes grafted on the same plant with rather pretty effect.

THE COMMON OAK AND THE RED OAK.

THE difference between these two native Oaks has been a matter for dispute. By MM. Boppe and Jolyet in *Les Forêts*, the difference is made clear, an easier matter in France and other parts of the continent, where there is a larger area in which to compare the two kinds. The nature of the soil seems a matter of small moment, both Oaks being at home in clay, if not too compact. Although it had long been thought that both kinds were equally indifferent in this respect it is now known that the common Oak needs a cooler soil than the Red. Soils formed of clay and sand, and even submerged at certain seasons, are especially favourable to it, as essentially a tree of the plains and valleys. The Red Oak prefers lighter soils, gravelly, sandy, or chalky, it matters not if given enough clay to maintain the coolness which is indispensable. Its favourite situation is on the slopes of hills, table-lands, or the sides of mountains, where it finds all the conditions which it needs. In planting it is impossible to over-rate the importance of this difference between the two kinds. Both Oaks are found almost everywhere in France, save on the high mountains and in the warmest parts of the south. The common Oak is most abundant in the south-west where it is almost the sole tree of the forests of the Landes and the Adour basin. In Normandy it is common in hedgerows, and is frequent in the alluvial soils of the Saône and the great valleys. The Red Oak prevails in the central and more hilly regions of France, being found at a height of 3,000 feet and upwards. It prevails in the temperate zone, characterising with its abundance a region which often merges with that of the Vine. VARIETIES:—As is common in trees of wide distribution these two kinds are found in minor varieties, of which two are well marked. The Downy Oak is a form of the Red Oak,

common in the south of France, though often only as a small tree, crooked and misshapen, and even no bigger than a bush, but remarkable for its endurance in stony barren soils, sunscorched through a great part of the year. The June-leaving Oak is a variety of the common Oak, which is slower to come into leaf, and so less exposed to damage by late frosts. This characteristic is very marked when grown side by side with the common form, there being a difference of from four to eight weeks in their time of leafing, the one kind being frequently in full leaf before the buds of the late form begin to expand. This sub-variety is common in the valley of the Saône, in parts of that of the Loire, and in other districts of central Europe. The habit of the tree is also more upright, an advantage due perhaps to its rarely being checked by late frosts.

THE CLIMBING SOLANUMS.

THE Solanum family embraces plants of much and varied beauty from all parts of the world, many of them remarkable for their fine foliage, often beautifully spined and cut; some interesting in their brilliant fruits found in many colours; and others valued for their fine flowers. Though several amongst them bear coloured fruits, the merit of the climbing Solanums lies in their flowers, borne in profusion as hanging clusters which, seen upon a garden wall or a greenhouse roof, are exceedingly attractive. They are most of them natives of South America and the West Indies, so that even in mild districts, few can be used in the open in this country but amongst greenhouse climbers there are none better worth growing, or so easy in culture. Their growth is rapid, and young plants (which are easily rooted as cuttings) grow fast and flower within a few months. They need little attention beyond keeping clean, and a good pruning in early spring. In a family so vast there are many species which are mere weeds, and often dangerous, as in the case of our native Bittersweet, but the following kinds are beautiful and of great value in gardens:—

HORN-FRUITED SOLANUM (*S. cornigerum*). —Though the erect star-shaped violet flowers of this species are not without beauty, its distinctive merit lies in the hanging fruits of fine appearance which succeed them. They are as

large as a hen's egg, orange-yellow, and curiously marked with five horns or corners near the stalk. Stove. Brazil.

THE POTATO TREE (*S. crispum*).—A hardy ornamental Solanum, widely grown as a wall shrub in the milder parts of England and Ireland, but only safe in the warmest districts without this protection. Old plants reach many feet in height, and even when cut by frost quickly renew themselves; indeed, it is well to prune back the strongest shoots as an aid to flowering. So rapid is its growth that in one season quite a small plant will cover many yards of surface. It is as common in Chili as our English Bittersweet, growing in the poorest soil; and poor soil is the best for it as tending to flowers rather than leaf. The leaves near the base are often large and broad, but are smaller on the upper branches and flowering shoots, oval, with a crisped margin. The flowers, carried in late summer, are in massive clusters of purple-blue or mauve-white, sometimes succeeded by small white berries; in the south of France these bunches of fruit are handsome.

JASMINE-FLOWERED SOLANUM (*S. jasminoides*).—This is one of the most beautiful of climbing plants, with neat foliage and starry white flowers, and is quite hardy as a wall shrub in many parts of the south of England and Ireland. It may be kept low, when it flowers freely from side-shoots; or, if left to itself, it rambles a long distance, bearing its clusters in white profusion. These are useful cut, either for vases or as long sprays. If grown in the open it should be in a light soil and a cool corner, where protection can be given during severe weather; it will do well in a north aspect if not too exposed in winter. In the greenhouse it is an excellent pillar plant, but loses its leaves in winter. Spring cuttings make many feet of growth in a season, flowering freely. There is a variety, *floribundum*, which is even more free and its flowers a trifle larger, though smaller in leaf.

BLUE STAR-FLOWERED SOLANUM (*S. pensile*).—This fine climber, of vigorous growth, is not often seen in gardens, but a plant is growing in one of the smaller houses at Kew, and has been beautiful with its hanging clusters of bright violet-blue flowers throughout the summer. The single flowers do not appear at their full

size, because the outer petals are somewhat reflexed, throwing into relief the star-shaped white eye and yellow stamens in a way that is attractive and unlike other kinds. Demerara and Brazil.

SWEET-FRUITED SOLANUM (*S. platense*).—This is a true creeper, which, instead of rambling over the surrounding vegetation creeps over the ground, rooting freely as it goes, but



WENDLAND'S CLIMBING SOLANUM.

seldom rising more than a foot high. It is found on the banks of the Rio Plata, covering the poorest ground with its carpet of grey downy leaves. The flowers, coming on short erect stems, are white and bell-shaped, followed by berries of the same colour, which are sweet and eaten as fruit.

SEAFORTH'S SOLANUM (*S. Seaforthianum*).—This is a plant of smaller growth than most of its fellows, bearing abundant light green

foliage, prettily cut, and very free in its flowers of reddish-lilac or mauve with a conspicuous yellow centre. Though an old plant (first grown in 1804) it has never become common under glass, but has been used with success of late upon the Continent as an outdoor summer flower. Cuttings root readily, and their growth is so rapid as to flower freely the same season. Mature plants bear flowers during the whole of the summer, which are followed by pretty clusters of orange-coloured berries of the size of peas. Grown in company with the Jasmine-flowered *Solanum*, its contrasting effect is beautiful, but, as a native of the West Indies, it is tender, and can only be used in the open for a few months and in warm nooks. It is best grown under glass, where it reaches 6 to 10 feet in the season, flowering during a great part of the year, and always in good leaf. Easily grown from seed.

PRICKLY CLIMBING SOLANUM (*S. trilobatum*).—A climbing shrub, rising from 2 to 5 feet in height, found in Ceylon and the East Indies as a twining creeper, armed in every part with stout spines. The flowers vary from violet and blue to white, carried in loose bunches and followed by handsome fruits the size of a small cherry. A fine stove shrub.

WENDLAND'S CLIMBING SOLANUM (*S. Wendlandii*).—Visitors to Kew are familiar with the fine form of this plant suspended in one corner of the Succulent House, every shoot bearing its dense terminal cluster of purplish-white blossoms, each bunch measuring nearly a foot across. On the continent it has become popular of late years, and is now propagated in large quantities. There, it is nothing unusual to see pot plants only 2 to 3 feet in height, already bearing several bloom-clusters, and special attention has been given to this low bush-form for markets and gardens. Nor is it nearly so exacting as to temperature as its habitat would at first sight imply; on the contrary, it is freer and its beauty more lasting in a lower than stove heat, and it may be wintered with ease in any house secure from frost. Like many tropical countries, Costa Rica, its native home, embraces much variation of climate and temperature, from mountain snows to tropic swamp, and this plant, in common with the new Climbing Dahlia, comes from the temperate upland districts. Like most vigorous climbers, however, to see it in full beauty it must have plenty of room and rich

light soil, aided by copious waterings when in active growth. Under such conditions it thrives, continuing in bloom the greater part of the summer and autumn. The bold and variable foliage is handsome; the stems slightly prickly. The blossoms vary in colour according to the vigour of the plant and the time of year, from a deep to lighter purple, or shading to white, with a bunch of golden stamens in the centre; those grown in partial shade or planted out being the deepest in colour. *The Garden* published a good coloured plate of this plant on February 1, 1890. When at rest it loses many of its leaves, and is then easily trained and cut back as required; in fact, to secure good new growth, this is advisable. In many districts it may be well used in the open during the summer, where, trained on walls or trellis-work, its massive clusters are fine. It is easily grown from young shoots taken with a heel in spring, or may be rooted from sections of the fleshy stems removed in pruning, care being taken to keep a sound eye at either end of the sections, which are placed in heat as ordinary cuttings.

There is a variegated form of the Common Bittersweet (*S. Dulcamara*) sometimes seen in gardens, but the plant is so highly poisonous that even were it desirable in colour, it is dangerous to have it anywhere near a house.

THE GARDEN BEAUTIFUL. HOME LANDSCAPE AND HOME WOODS. WOODS WITHOUT FENCING.

Proof that any kind of fencing is needless in established woodland is afforded by millions of acres of forest in many parts of middle and northern Europe, on mountain or plain, without fence of any kind; young or old trees as they come, boldly fringing river, rocky valley or plain. No stiff or hard lines anywhere; the wood gracing the near land as the clouds grace the sky, while far away the hills massed and crested with Pines show fold beyond fold back into the delicate distance, in fine harmony in all lights, but loveliest when the sun bids the woods good-night in a sea of golden-purple air. If it be well to be free of living fences of Wild Rose, May, and Holly, how much more the costly iron or wire fence, so ugly in any place where we seek beauty of wood or landscape? And this freedom from the ceaseless care and cost of fences is not won

by those who plant the wood for beauty, but by the men who look to their woods for profit; only in doing their work in the simplest way they find the palm of beauty too. But this happy escape cannot be where the underwood plan is a never-ending nuisance with its cutting up of woods and drives, the underwood cutters in recent years remaining in the woods for more than a year after the cutting; which is wrong for many reasons. If we wish to preserve some underwood where there is good use for it, it is easy to keep it towards the centre of the masses of wood and so dispense with fencing from cattle; or we may even grow it as at present without sacrificing all our woodland scenery and any hope of profit from woodland. Our way in Britain of planting in skinny strips, instead of massing the wood in any natural way, very much adds to the cost and ugliness of the iron fence; both sides of the narrow strip of wood being often fenced with iron, and on some estates the money spent on this rubbish of iron and wire would suffice to plant all the poor land of a parish.

These words are written in a grassy glade of about a dozen acres set in the woods of the Bohemian hills. Falling gently to the west it is embosomed in close-set young trees—Spruce, Birch, Scotch and Silver Fir; there is no stiff or hard line to be seen; the glade is fringed as it might be in a natural forest. This glade is as easy to mow as if it were fenced in the stiffest way; it could be grazed without danger, as there is no underwood near. The work of the woodman around the glade (and there is a good deal of winter work in woods where tall trees are set close) is far more simply done than where, as in many parts of Britain, access to every copse and wood is barred with fencing. For days we pass through such woodland and never see a fence. When we leave the massed mountain woods, and go into the open plain, with smaller woods here and there, cresting a hill or making the best of a vein of poor land, it is just the same; there is no fence; cattle or men may take shelter or shade; and as the margin of the plantation is often free and varied, the effect is far better than when the wood is held tight with a fence. Certainly many of these are old woods, and when planting in an open country, with cattle grazing on all sides, we cannot hope to get free at once from a great evil; but if we deal with

vigorous trees only, a few years' good growth will make them safe, and tall trees do not tempt cattle as do the shoots of the underwood. And if there be grazing creatures about, why should not the welcome shade of the wood be free to them on hot days and its shelter on wintry ones if no harm come therefrom? * * *

THE SWEET VIOLET AND ITS VARIETIES.

EVERYONE loves the Violet with its quiet beauty, its message of oncoming spring, and its ready response to the early sun from its nook amongst the scattered leaves of the wood or the bowered bank of the hedgerow. Time was, and not far distant, when all alike were well content with these wayside gatherings, but as the demand increased the wild supplies failed, until the Violet found a place in gardens as offering a more assured harvest. And so began the slow improvement of the flower, our choice enriched in turn by the Violets of southern Europe and of Russia. When the Second Empire reached its height France became the centre of its culture, and the first perpetual and large-flowered varieties were raised by the market growers of Paris, *Souvenir de Millet père* being the earliest gain of these growers. This first step gained others quickly followed in the *Czar*, and *Gloire de Bourg la Reine*, of the large-flowered section, and similar improvement in the perpetual-flowered (*Violette de quatre saisons*) and the Parma Violet classes. At short intervals there followed sorts like *Luxonne*, *Wellsiana*, and that fine Violet *Princess of Wales*, the advent of which, with their great size and length of stem, led to further demand for the flower. From this time the number of new kinds has yearly increased until the garden Violet of to-day is hardly traceable in its lowly woodland form; yet the increase in size of petal, length of stem, and season of bloom, has been gained with little if any loss of beauty of form or fragrance. Within the last few years there has arisen in some quarters a taste for Tree-Violets, in which infinite pains are wasted to induce an ugly and unnatural stem between the roots and the leaf-crown: it is a pity that growers cannot find something better to do.

Except in favoured districts or mild seasons Violets do not flower in the open with freedom till spring is well advanced, and for this reason

it has become usual to grow them under glass during winter and early spring. Though perfectly hardy, no plant is more sensitive to rough wind, and in the border its growth is often so checked by the biting blasts of spring that before the plants can recover, warm days come with a rush, cutting short the season of its outdoor beauty. For this reason Violets are less grown in gardens than their beauty deserves, because gardeners cannot count upon their making so effective a show as bulbs and other things which are less sensitive to adverse conditions. Still, in many gardens where no glass can be given up to them, more might be done to make the Violet a success by the adoption of simple means. For early flowers the Violet border should be of free light soil which is sensitive to sunlight; this is best as a raised bank sloping towards the sun, to get the most warmth and the least risk of stagnant water; if beneath the shelter of a wall or thick hedge to break cold winds, so much the better. The plants should be well surfaced in autumn, and sheltered at night by thick straw mats resting upon a low wooden framework just clearing the plants. This is a great protection, shutting in whatever warmth may be in the soil and shutting out frost and the cold dews which are almost as great a check. To keep these mats dry in wet weather it is a good plan to run a roll of tarred cloth over the straw when rain threatens. The mats themselves are rolled up in a couple of minutes in the morning, as soon as the dew is gone and the first chill off the air. Plants so treated will bloom some weeks earlier than the main crop, and by a choice of varieties, by starting runners at different times of the year, and by setting a few tufts in different aspects, the season of flower may be much lengthened. To do this it is not necessary to have lined beds in all parts of the garden, but a few tufts of violets never look out of place anywhere, and after a few trials spots will be found favourable to early and to late flowers. The best flowers are borne by young plants in their first season, and after the second year they should be renewed. The best plants for early flowers are grown from runners rooted the previous autumn in boxes of light soil, and wintered under glass. I prefer a light but deep soil, early planting, and growth in full sunlight for the main crop; it is easier to guard against heat and drought in summer than to ensure a

good result in spring upon cold stiff ground. Much also may be done to make the border beautiful by adding clumps of early flowering bulbs, which vary the dead level of the Violets and are good in contrast of colour, whether it be Narcissus, the spring Star Flower (*Tritelia*), Hyacinths, Tulips, or anything else of suitable colour.

The Violets of the Riviera are known all over Europe by their winter flowers, forming the object of a great industry, of which export, scent, and preserve-making are branches. They are grown by millions in full sunlight, or in the light shade of the Olive trees upon the hillsides, and their lavish profusion in March and April exceeds anything seen further north, the spring being long and genial enough to induce full vigour. The effect of these carpets of Violets seen in southern gardens is only equalled by that of Bluebells to be found in English woods during May. Anyone in the neighbourhood of Grasse at such a time should make an effort to see the lawn of Violets in the beautiful gardens of Lady Alice Rothschild, at Villa Victoria. When in full bloom it is a sight never to be forgotten. Tens of thousands of plants in an unbroken stretch of verdure, the green of which is almost blotted out by the living sheets of purple. In a rapid review of the best named varieties we shall omit the Parma Violets, belonging, we believe, to another species; in any case their growth, character, habit, and flowers, are so distinct as to form a class of their own. I include all the named sorts which have been grown to any great extent, though some of the older kinds have now largely disappeared, their places taken by better new kinds. There are also a few new varieties, and a certain number of small-growing but pretty plants, more suited to the rock-garden than the Violet border.

Abonnen Nevue.—A local variety largely grown around Hyères. It is a vigorous plant with large flowers of bright violet and a good winter yield.

Admiral Avellan.—Distinct from all others in its large flowers of fine reddish-purple, brightening in colour as the season advances. They are borne upon stout erect stems and with leaves of rounded outline, and if not of full size, the blooms are very sweet and good for bunching. Its colour is of fine effect in broad masses, and the rather irregular shape

of the flowers is often preferred to the rounded outline of others. It is one of the most popular garden varieties, spreading fast, neat, very hardy, and doing well in heavy soils.

Baronne de Rothschild.—A new variety raised at Hyères and named after Lady Alice Rothschild by one of her gardeners. Like *Luxonne*, but deeper in colour, with a large long-petalled flower, borne upon good stalks. Said to be a good winter flower, and one of the largest in size.

Bleue de Fontenay.—A flower of the perpetual class, of a peculiar bronzed shade of purple; uncommon and pretty in the rock-garden.

Brune de Bourg la Reine.—The great value of this kind is its lateness, making it useful to lengthen the season of flower; a neat grower with dark purple blossoms.

California.—An American variety, and the first of great size. With this plant the experience of growers has been varied, some finding it a failure and others just as warm in its praise; the explanation seems to be that it rarely does well upon any but light warm soils, running to coarse leaf when on stiff ground. It is vigorous, almost rank in growth, with great length of stem, and flowers of a light violet-blue, with petals long, rather narrow, and the upper ones set wide apart, giving the flower a distinct appearance, combined with sweetness and a graceful pose. It is not a neat grower, requires wide spacing, and becomes untidy without frequent division, though its great vigour preserves it in a great measure from red spider. It is now replaced in many gardens by kinds of better habit.

Cleaveon Hall.—A plant forming small neat masses for the rock-garden, with a wealth of deep purple flowers in early spring.

Comtesse Edmund Dutertre.—A new flower of a fine clear blue, not large, but good in colour and stem, and for autumn and winter bloom. It does well with slight protection, coming in early and lasting well.

Czar.—An old deep-coloured flower and still a great favourite, being very free and reliable, good in the autumn and on heavy soil, very sweet, and of conspicuously neat habit. It is now grown in an improved form as *Smith's Seedling*, a plant valued by English growers.

§ *Explorateur Dybowski*.—Another of the older kinds; a robust grower with flowers of

deep purple contrasted with foliage of light green, and of long season.

Gloire de Bourg la Reine.—An old kind still much grown near Paris for its large sweet flowers with very long stem.

Gloire de Hyères.—Another local kind, of good form and habit, rather like *Princess Beatrice*, but valued by the southern growers for its resistance to cold and its winter yield in the open.

Grosse bleue.—Mainly grown around Paris as a succession to the southern Violets. It flowers freely in autumn and again in spring after an interval of some months, coming thus to open and complete the season when other supplies fail. It is of a pretty light shade, effective in bunches.

Italia.—Sometimes grown on the Continent; like *California* in colour and habit but with a longer season.

John Raddenbury.—A new Violet from Australia with good form, vigour, and sweetness, the flowers of a shade of light blue which is new and attractive, and still further increases the range of colour found in Violets.

L'Inépuisable.—A plant of the perpetual class, with neat habit, toothed leaves, and flowers of medium size, but with a long season, starting in early autumn: not subject to red spider.

La France.—A very large flower of dark violet blue, very hardy and free, and a favourite where dark flowers are preferred. It is of good habit, shorter and neater than other large kinds, with stout rigid stems which display the flowers to perfection. It is for general purposes one of the best kinds, young plants blooming very early.

Le Lilas.—An old form of the perpetual class, very early under glass or in the open, with smallish flowers of rosy-lilac.

Luxonne.—A fine plant of the perpetual class, deep in colour, robust and free even in cold weather in its large-petalled flowers, pointed in outline, and of a pale blue. It suffers little during summer, and is mostly free from insects and disease.

Madame D. Arène.—A plant like the preceding but deeper in colour and not so large; spreads fast.

Mlle. A. Pagès.—A new perpetual flower, with light blossoms flushed with rosy-purple, fairly sweet, and neat in growth. Being small,

and short in the stem, its place is in the rock-garden.

Mignonette.—A neat rock-plant of dwarf habit and small flowers of pale sky-blue ; distinct and hardy.

Nana compacta.—Another dwarf kind, very sweet, and without runners ; free in spring and autumn with flowers of bright violet-blue.

Odorata rubra.—The pink form of the common Violet, with small flowers, sweet, and free ; pretty in the rock garden. A distinct form is now offered under the name of *Perle rose*, with flowers of a brighter silvery pink.

Princess Beatrice.—Another variety raised at Hyères, the great southern centre of Violet culture. It is a good plant of sturdy habit, with neat flowers of rounded outline and pure violet colour ; smaller and less vigorous than the large pale blue flowers. It is much grown under glass in winter for the northern markets.

Princess of Wales.—The largest of all, with broad petals set close and forming a massive flower often nearly 2 inches across, fragrant, vigorous, and with a wiry stem of great length. Its loose habit and light blue colour are sometimes criticised, but, especially in warm light soils, it is very fine and has a cheerful gleam as of sunshine on the dullest of days. On cold soils it is rampant and not so good in flower, while its big growth is exposed to injury in keen frost or wind ; in bleak districts it is best under glass. Where conditions are in its favour (as on the Riviera, where it is grown in vast quantities) it is the finest of all, very effective in broad masses, and most useful in its length of stem for bunching and decoration.

R. Augustine.—A new kind of the perpetual class, a plant of small growth with flowers of an intense black violet. Its only value is as a rock plant distinct in its deep colour.

St. Helena.—A small hardy kind with flowers of a pale and rather undecided blue colour ; best in the rock-garden.

St. Anne's Pink.—A dwarf variety claiming to be the truest red in cultivation ; rock garden.

Semprez.—An old free-flowered kind, still considered one of the best for winter forcing by the Parisian growers.

Souvenir de Millet père.—The oldest large-flowered kind, still much grown under glass in France for its fragrance and freedom in winter.

Victoria.—An old sort of neat growth and

intense colour, still widely grown as being constant, and useful for its freedom and lateness in flower. In the south of France it is seen massed with fine effect in late spring.

Wellsiana.—A plant of neat habit and regular growth, with large flattish flowers of a fine deep blue, of good substance, coming early into bloom and very persistent. The flowers are well shown, but the stems are shorter than in the new kinds.

Wilson.—An old kind raised in Algeria and at one time widely grown for its earliness and freedom in flowers of a pale mauve colour upon long stalks. It is now in a great measure superseded. There is also a variety with variegated leaves called *Armardine Millet*, used in France for bedding, but of little real merit.

LIGHT FLOWERS.—The choice of single white flowers is small, comprising a few pale forms of feeble rendering. The two best are *White Czar* and *Rawson's White*, with fair sized blooms, sweet, well carried, and pretty in contrast with the dark kinds, but their growth is feeble as compared with the best of these. An Italian seedling with pale striped flowers is *Princesse de Sumonte*, showing a blend of white and light blue shading to mauve ; it has gained some notice abroad, but is of small value as seen in this country.

DOUBLE FLOWERS.—Nor is the choice of double-flowered kinds much larger when the Parma Violets and the minor unnamed kinds are left out of account. For early bloom these must be grown under glass, for with bad weather they are uncertain and poor. The following sometimes do well in late spring when frame-grown flowers are past : *Blanche de Chevreuse* is a late sort with full flowers of white, flushed with pink when old ; *Belle de Châtenay*, also late, with larger flowers of faint blue and white. A kind bearing as name *Blue and White* shows a more marked blending of these colours. *Blandyana* is a combination of deep violet, white and pink. The best dark doubles are *King of Violets* and *Carter's Mazarine Blue* ; *Bertha Barron* of a lighter shade, as is also *Patrie*, a very full flower, of great fragrance and freedom. The double form of *Victoria* is sometimes grown, and at its best is fine, with large flowers of good colour ; it is, however, so late that its season is brief and its stalks too short to make it of much use. B.

NYMPHÆA GIGANTEA, HUDSON'S VAR.

THIS Water Lily was raised in the gardens of Gunnersbury House three years ago, the seed coming from the wild plant—*N. gigantea*. I cannot see that

flexed in the way shown in the engraving when the bloom has been open about two days. We have measured flowers up to $10\frac{1}{2}$ inches in diameter. One distinct feature of this Lily is the robust flower stems, which rise nearly



THE GIANT BLUE WATER LILY (NYMPHÆA GIGANTEA, HUDSON'S VAR.).
(Engraved for "Flora" from a photograph at Gunnersbury by George Champion.)

any cross fertilisation has taken place, but it is distinctly better than its parent in colour, in size of flower, and in breadth of petal; these become re-

erect and a foot or more clear of the water. Our plants are growing in a tank heated from beneath to from 70 to 80 degrees. The tank is covered with glass,

but the lights are so made that they can be lifted for free ventilation, even to the present time (end October). The depth of soil and water is 18 inches—first a layer of coarse rubble and then soil—in all about 9 inches with another 9 inches left for water over the soil. This consists of good turfy loam, road grit, and leaf mould, but no manure of any kind is used. We start this Lily into growth in February or March. Till that time, from now onwards, the temperature of the water is allowed to drop to 55 to 60 degrees and the plants go comparatively speaking to rest, nor do we disturb them until growth re-commences. Each one is then lifted with the live roots attached and laid aside in water whilst the tank is cleaned, being then replanted. We have now a large number of seedlings in active growth from this year's seed sown as soon as ripe; these will flower in June or July of next year. A first-class certificate of the Royal Horticultural Society was, I think, unanimously awarded to this new variety in July last. The plants began to flower in May, and have been in flower ever since, but their size is now much diminished. I had the original stock of *N. gigantea* from Mr. Low, gardener to the Duke of Grafton at Euston Hall, Thetford, who told me that he had flowered it for several seasons in a tank in the stove. On seeing my first exhibit of this seedling he agreed that it was distinctly finer than the parent plant. This was at the last Holland House Show. Mr. F. W. Burbidge and other lovers of Water Lilies agree that it is a good addition to our aquatic plants for warm water.

JAS. HUDSON.

PEAR ORCHARDS FOR BEAUTY.

SOME of the most beautiful things in our garden or home landscapes are the orchards of the West of England, more often planted with the Apple than with the Pear. The Pear tree in this country is neglected in this respect, and should be much more grown as an orchard tree for its beauty even if not for its fruit, yearly growing in value. Some Pears gained in our own time, like *Doyenne du Comice* and *Beurré Dumout*, are worth a score of the old kinds. It should be remembered that the Pear tree is finer in form and stature than the Apple, and it is not rare to see trees in Worcestershire of the size of forest trees, and such trees, with their varied and picturesque form, are worth thinking of when planting for beauty.

The use of the Quince as a dwarfing stock for many years past in England has been rather against the Pear as an orchard tree, because any kind grafted on this stock never succeeds as a standard tree—the only form we now have in mind. In our fertile valleys and the rich soil of gardens the Quince is often a good stock, but over a large area of poor sandy and chalky land it is worthless, and its wide use has done much harm to Pear cultivation upon such soils. In using the Pear or natural stock we may be sure that it will do well on any land, be it heavy Wealden clay or the lighter upland soils. It is true we must wait for results; the standard Pear is a forest tree in its way, and must be allowed time to mature, but it is surely better to let the years run by in that way than to plant trees which may never succeed as standards. For trees so planted to endure we should choose good kinds that ripen in our country, and see, in every case, that they are grafted on the wild Pear—their natural stock—since we cannot easily have them on their own roots, though it would interest me much to see them on their natural roots, and I have two Pears so grown which look far healthier this autumn than any others. The most important point of all is that of varieties. We should never plant any but good Pears, which, as standards, will ripen in our country under any fair conditions. Here are the names of those found to possess these qualities:—*Beurré Giffard*, *Fargonelle*, *Beurré Goubault*, *Beurré Dumont*, *Beurré d'Amanlis*,

Beurré Hardy, Fonaante des Bois, Louise Bonne, Rousselet de Reims, Conseiller de la Cour, Doyenné du Comice, Marie Louise, Urbaniste, Soldat Laboureur, Triomphe de Jodoigne, Comtesse de Paris, Nouvelle Fulvie, Bergamotte Saumier, Charles Cognee, Doyenne d'Alençon, Josephine de Malines, Suzette de Bavay. Much has been said of late about the advantages and disadvantages of planting in grass as a "matter of scientific experiment," but most growers of Kent, and other orchard counties have long known that in hop, arable, or any other land, the trees show quicker growth and greater vigour at first. But it is not everyone that cares to break up grass to plant an orchard, and we can do very well for grass by mulching the ground round each tree for a few years, until they have gained a good hold.

These words were fresh penned when I came across the following notes by M. Charles Baltet of Troyes. Though treating of the matter somewhat differently his words are very apt, and he also mentions various kinds of Pear as of value for their beauty, which are unknown to English growers: "We shall find that the habit, the foliage, and the fruit of the Pear tree leave nothing to be desired, no matter in what soil or climate it may be grown. It is true that a group of prolific, large-fruited varieties such as *Beurré de l'Assumption, William, Van Marum*, and others, will always be a delight to the lover of fruit, but the artist will look for effect from the natural appearance of the trees. If he wishes for luxuriant growth he will find it in the Pear known as the *Curé, Conseiller de la Cour*, and others. *Beurré Haray, Vanquelin*, and *Duke de Nemours* have long upright branches, while those of the *Beurré d'Amanlis, Bon Chrétien*, and *Triomphe de Jodoigne* spread out more or less horizontally, or even curve downwards. *Arbre courbé* and *Nouvelle Fulvie*, would not be out of place as drooping trees; while we may admit a group of Pear trees which grow as natural pyramids, such as *Fondante du Panisel, Beurré de Nantes, Fondante de Noël, Beurré d'Angleterre*, and a number of others, including *Charles Ernest*. The beautiful foliage of the *Sucrée de Montluçon, Delpierre*, and *Triomphe de Jodoigne*, is rivalled by that of the *Mikado* and *Daimyo*, two varieties of Japanese origin, with large, thick, and somewhat cottony leaves. We have the German *Kopertscher*, the Belgian *Délices de Jodoigne*, the American *Philadelphia*,

the French *Gil-ô-Gile*, which present the same character. The observer who takes notice of the particular characters of each variety will know that *Marie Guisse, Monseigneur des Hons*, and *Royale d'Hiver* are the first to show their buds in the spring, while *Martin sec, Madame Lorial de Barny*, and *Herbin*, seem sorry to shed their leafy clothing in the autumn. *Bonne d'Ezée* and *Doyenné d'Alençon* are the earliest to flower, and *Alexandrine Douillard, Sylvange*, and *Nouvelle Fulvie* protect their clusters of flowers with a sheltering rosette of leaves as soon as they open. If we wish for Pear trees with double flowers we have *Comte Lelieur* and *Beurré de Naghin*, with their regular outline, or the double-flowered *Bergamotte* and *Calebasse Oberdieck*, with their drooping petals. Without being able to compete with the coloured barks of the Birch, the Scarlet Dogberry, or the veined Maple, we may content ourselves with the ash-coloured bark of the *Bési Dubost*, the ochrey *Passe Colmar*, the violet *Beurré Giffard*, the purple *Doyenné Flon aîné*, the dark brown *Bon Chrétien de Bruxelles*, and the bright-barked *Fondante Thirriot*. We have beauty of stem in *Van Mons, Deux-Sœurs, Angélique Leclerc, Beurré Lebrun*, and others, the last having a stem which looks as if it had been sprinkled with carmine. The study of local fruits has provided us with the *Poirier de Fosse*, which in the department of the Aube, is as large and tall as an Oak. A group of some of these sorts in either park or garden would give us as much pleasure as any isolated tree or clump of trees."

And here we may also say a word for some of the Wild Pears of Europe, particularly the little-known species of the region of the Danube and Southern Russia. Many of these eastern kinds are distinct and beautiful in growth and appearance, and their leaves take on the richest autumn colouring, in shades of purple, crimson, orange, and gold, which would give fine effect in the wild garden even if valueless in other ways. The autumn colour of some of our orchard Pears is also beautiful, particularly in some soils; an orchard of Pears is finer in this way than any of our other fruits.

And apart from these are the Pears grown for Perry, an interesting group of which we have no knowledge in the home counties, though in some parts of the west they are

grown. So that on the whole there is no lack of fine things to go to the forming of what would prove a charming addition to many a country seat—a Pear orchard with the trees all in their natural forms. * * *

THE GREATER ROSES.

THIS is an important subject for all who think of a real flower-garden and seek to avoid the ugliness of the pitiful substitutes for it both in France and England. The stereotyped gardens are even worse abroad than at home, since the French and Germans have taken mosaic culture from the Italians, and are riding it to death. I have lately been through one of the most beautiful parts of France—the valleys of the Loire and Cher, where all things in Nature are beautiful, from clear sky to river bank, the one human blot on the whole being the dabs of mosaic culture in spots that ought to be the most sacred:—before a group of fine Cedars, the far side of a wide lawn, or against a beautiful old château. No such things ought ever to be seen in the foreground of a beautiful house, and to avoid these horrors we have (among other things) to think first of the *great* Roses. It is a question which is obscured by the stupid division of Roses into many classes, by giving an exaggerated value to some, and by the still prevailing error of growing mainly the summer-blooming kinds. In catalogues also we see Roses of poor quality, like *Homer*, described in glowing terms year after year, and not enough care is taken to exclude Roses which do not open well in parts of our country, like *Francisca Kruger*. Raisers, too, are not careful enough to exclude Roses of poor colour and effect

for the open air, in which distant effect has to be reckoned with; and so for its colour I exclude *Marquise de Salisbury*. Also, with perhaps less reason, Roses with long and absurd rigmaroles of names, and kinds like *Niphetos* and *Comtesse de Frigneuse*, which are not good for open air culture. There are also a certain number that are apt to break into many heads, like *Comtesse Riza du Parc*, which may be pretty in their first season but gradually become less so. I was nearly excluding *Maman Cochet* for this habit and for its general want of effect throughout the year: famous as it is, I should not at all place it near what I should call a *great* Rose. The need for this list is proved in one way at least, by the fuss some make about poor Roses such as *Crimson Rambler*, which give their few weeks of colour and then subside for the season. Such Roses may be of some value on outhouses, and among trees and shrubs here and there, and to give a pretty effect for a time, but they are not worthy of mention beside such sorts as are beautiful the whole summer and autumn. There is, unhappily, a greater cause of exclusion than all these, and that is the effect of grafting all the fine Tea Roses on the Briar. The last Tea Rose in my chosen list, *Yvonne Gravier*, even when I get it from the best source, is very apt to die when on the Briar. A few suckers that I got off on their natural roots do much better. In my trials, embracing thousands of Tea Roses, a great many constantly die back. They flower well the first year and then perish slowly, flowerless ever after. So I am haunted always by the

fear that we have lost many of our finest Tea Roses in this way. I do not divide great Roses into classes, because there is no need for it. It is the modern mania for making classes when no real distinction exists, which leads our societies to classify Roses into garden and exhibition kinds, as if *Marie Van Houtte* and

whit more rational, for all are hybrids. The following list is based upon many plantings and may contain kinds not good in all situations, but it embraces the pick of all classes. The question of culture comes afterwards and is a serious one, because over much of our country we have poor light soils, chalky



ROSE " BESSIE BROWN," (Engraved for " Flora " from a bloom in Benjamin Cant's Nursery, Colchester.)

Anna Olivier, among the best of open-air Roses, were not good enough to take their place in any show, even with their beautiful foliage cut off and set in ranks like cabbages in a market stand. Dividing one group into hybrids and another into non-hybrids is not one

often, and often too dry for the Briar. As the whole of the trade growers in Europe propagate their Roses on the wild Dog Briar we have to put up with it, and as a result in many districts people assume that they cannot grow good Roses at all,

THE GREATER ROSES—continued.

Abbé Brammerel, Abel Carrière, Adélaïde Côte, Adelina Vivian Morel, Agnes C. Sherman, Aimée Vibert, Albert Patel, Albert Stopford, Alexandra, Alfred Colomb, Alfred K. Williams, Alsace-Lorraine, Ami Stecker, Anna ae Diesbach, Anna Olivier, Annie Wood, Antoine Gaunet, Antoine Mouton, Antoine Quihou, Antoine Rivoire, Antoinette Durieu, Archduchess Eliz. d'Autriche, Archduchess Marie Immaculata, Auguste Comte, Augustine Guinoisseau.

Baron J. B. Gonella, Baronne A. de Rothschild, Baronne de Blochhausen, Baronne de Fonville, Baronne Fanny van der Noot, Baronne Henriette Snoy, Beauté de Grange de Héby, Beauté de l'Europe, Beauté Inconstante, Belle des Jardins, Belle Siebrecht, Berthe Thouvenot, Beryl, Bessie Brown, Blanche Moreau, Boadicea, Boieldieu, Boule de neige, Bouquet d'or, Bunel.

Cécilie Scharsach, Camoëns, Capitaine A. Malibran, Capitaine Millet, Captain Christy, Captain Hayward, Carmen, Carmen Sylva, Caroline d'Arden, Caroline Küster, Caroline Swailes, Caroline Testout, Catherine Mermet, Catherine Soupert, Céline Forestier, Céline Gonod, Charles Lefèvre, Chloris, Claire Carnot, Claire Jaubert, Cleopatra, Cloilde Soupert (tea), Commandant Felix Faure, Comte Amede de Foras, Comte de Raimbaud, Comte de Sembui, Comte François Thun, Comte Henri Rignon, Comtesse Anna Thun, — Cahen d'Anvers, — de Breteuil, — de Camondo, — de Grailly, — de Mercy d'Argenteau, — de Nadaillac, — de Paris, — Dusy, — René de Montmartre, — Théodore Ourvaroff and Comtesse Vitali, Conrad Strassheim, Cora, Corallina, Corinna, Cramoisi supérieur.

Deuil du Colonel Denfert, Devonienensis, Directeur Alphand, Distinction, Docteur Albert Moulounguet, — Anary, — Cazenueve, — Eugène Teixeira Leita, — Favre, — Felix Guyon, — Grandvilliers, — Grill, Dorothea Söffker, Duc Englebert d'Arenburgh, Duchesse d'Auerstadt, Duchesse ae Vallombrosa, Duchesse Marie Salviati, Duchesse Mathilae, Duchess of Albany, Duchess of Bedford, Duchess of Edinburgh, Duchess of Portland, Duke of Connaught, Duke of Teck.

Earl of Dufferin, Earl of Pembroke, Eclair, Edmee Metz, Edmond Deshayes, Edmond Sablayrolles, Edouard Gautier, Elaine Greffulhe, Eliza Boëlle, Eliza Fugier, Elizabeth Vigneron, Ellen Drew, Emilie Dupuy, Emilie Gonin, Empereur de Maroc, Enchantress, Ennemond Boule, Ernst Metz, Erzherzog Franz Ferdinand, Esmeralda, Etendard de Jeanne d'Arc, Etendard de Lyon, Ethel Richardson, Etienne Levet, Etoile d'Angers, Etoile de Lyon, Eugène Appert, Eugène Furst, Eugène Verdier, Eugénie Bouillet, Eugénie Frémy, E. Veyrat Hermanos.

Faivre d'Arcier, Ferdinand Batel, Ferdinand Chafolte, Fiametta Nabonnand, Fisher Holmes, Francis Dubreuil, Franz Deegen, Frau Karl Druschki, Frédéric Daupias, Friedrich Harms, Fürst Bismarck, Fusion.

Gardenia, General Appert, General Galliëni, General Jacqueminot, George Schwartz, Gladys Harkness, Gloire de Dijon, Gloire ae Libourne, Gloire ae Margottin,

Gloire des Cuivrées, Gloire ae Toulouse, Gloire Lyonnaise, G. Nabonnand, Goldelse, Grace Darling, Grande Duchesse Anastasie, Gruss an Teplitz, Gustave Piganeau, Gustave Régis.

Heinrich Schulteis, Hélène Cambier, Hélène Guillot, Helen Gould, Her Majesty, Hermosa, Hippolyte Barreau, Hon. Edith Gifford, Horace Vernet.

Impératrice Eugénie, Isabelle Gomel Pujos, Isabelle Nabonnand.

James Veitch, Jean Baptiste Varrone, Jean Ducher, Jean Liabaud, Jean Pernet, Jean Soupert, Jeanne Cuvier, Jeanne Forgeot, Jeanne Guillaumet, Johannes Wesselhöft, John Hopper, Josephine Mühle, Jules Finger, Jules Girodit, Julius Finger.

Kaiserin Aug. Victoria, Kaiserkrone, Kronprinzessin Victoria.

La Caleta, La France, La Rosière, La Sylphide, La Tosca, Lady Battersea, Lady Castlereagh, Lady Clanmorris, Lady Henry Grosvenor, Lady Moyra Beaucherc, Lady Sheffield, Laure Wattine, Le Soleil, Leon de Bruyn, Leon Robichon, Leon XIII., Liberty, L'Idéal, L'Innocence, Louis Ricard, Louise Darzens, Louise Odier, Lucie Jolicœur, Lucile Coulon, Luciole.

Mabel Morrison, Ma Capucine, Madame Abel Châtenay, — Alexandre Bernaix, — Alfred Carrière, — Antoine Mari, — Antony Chokens, — Anthérieux Périer, — Benoît Derroches, — Bérard, — Cadeau Ramey, — Carnot (tea), — Caro, — Charles, — Charles Boutmy, — Charles Monnier, — Chauvry, — Croze Cini, — David, — Ducher, — E. A. Nolté, — Helfenbein, — Emilie Charrin, — Errera, — Etienne Levet, — Eugène Resal, — Eugène Verdier (tea), — Falcot, — Ferdinand Jamin, — Furtado, — Gabriel Luizet, — Georges Bénard, — Desse, — Honoré Defresne, — Hoste, — Husson, — Isaac Pereire, — Jacques Charreton, — Jean Dupuy, — Jean Pierre Soupert, — Joseph Desbois, — Jules Cambon, — Jules Finger, — Jules Graveraux, — Jules Grolez, — Jules Margottin, — Lombard, — Louis Gravier, — Lucien Linden, — Lucile Coulon, — Massicault, — Moreau, — Mulson, — Noman, — Paul Marmy, — Pernet-Ducher, — Perrier, — Philemon Cochet, — Pierre Cochet, — Pierre Guillot, — Pierre Oger, — Prosper Laugier, — Raoul Chandon, — Ravary, — René de St. Marceau, — René Gérard, — Sancy de Parabère, — Thévenot, — Vermorel, — Victor Verdier, — Viger, — von Siemens, — Welche, — Zoetmans, Madeleine d'Aoust, Mademoiselle Jeanne Philippe, Mademoiselle Laurette, Mademoiselle Onofrio, Maman Cochet, Maman Loiseau, Mamie, Marchioness of Londonderry, Marchioness of Lorne, Maréchal Niel, Maria Duckhardt, Maria Thérèse, Marie Baumann, — Jaillet, — Louise Poirer, — Roussin, — Soleau, — Thérèse de Bourg, — Van Houtte, Marquise de Castellane, Marquise de Chaponnay, Marquise de Forton, Marshall P. Wilder, Marthe du Bourg, Mary Fitzwilliam, Maurice Bernardin, Max Buntzel, Maxime Buatois, May Rivers, May Paul, Medea, Mélina Peyrusson, Meteor, Milared Grant,

Miss Marston, Mrs. B. R. Cant, Mrs. Edward Mawley, Mrs. F. W. Sanford, Mrs. Harry Turner, Mrs. John Laing, Mrs. Robert Garrett, Moreau, Muriel Grahame, Oscar Cordel.

Papa Lambert, Paul Nabonnand, Paul Neyron, Pauline Bersez, Perle de Feu, Perle de Lyon, Perle d'Or, Pierre Notting, Pink China, Prefet Monteil, Pribislav, Pride of Reigate, Primrose Dame, Prince Camille de Rohan, Prince de Bulgarie, Prince Théodore Galitzine, Princesse Alice de Monaco, — de Bassaraba, — de Béarn, — de Radziwill, — de Sagan, — de Sarsina, — Etienne de Croy, — N. Troubetzkoï, — Beatrice (tea), — May, — of Wales (tea), Principessa di Napoli, Professeur Ganiviat.

Queen of Queens.

Rainbow, Raoul Chauvry, Reina Maria Christina, Reine Emma des Pays-Bas, Reine Nathalie de Serbie, Rêve d'Or, Rose Romarin, Rowland Hill, Rubens.

Safrano, Sappho, Schneerose, Scipion Cochet, Sénateur Vaisse, Silver Queen, Sisi Ketten, Soleil d'Or, Socrates, Souvenir de Camille Godde, — de Catherine Guillot, — de Gabrielle Drevet, — de Jean Ketten, — de Jeanne Caubaud, — de Lady Ashburton, — de la Malmaison, — de Laurent Guillot, — de Louis van Houtte, — de Madame Erneste Cauvin, — de Madame Levet, — de Madame L. Weber, — de Madame Sablayrolles, — de Marie Drivon, — de Paul Neyron, — de Pierre Notting, — de Rambaux, — de Spa, — de Thérèse Levet, — de Victor Hugo (tea), — de Dr. Jamin, — de d'un Ami, — de rosieriste Gonod, — of Wootton, Spenser, Sulphurea, Sunrise, Sunset.

Tennyson, The Bride, Thérèse Frank, Tillier, Tom Wood, Triomphe de France, Triomphe d'Orléans, Triomphe de Pernet Père, Triomphe de Rennes, Triomphe de Saintes, T. W. Girdlestone.

Ulrich Brunner, Ulster, Unique Yellow.

Van Houtte, Vicomtesse Decazes, Victor Hugo, Victor Verdier, Viscountess Folkestone, V. Vivo à hyos.

Waban, W. A. Richardson, W. Askew, W. F. Bennett.

Xavier Olibo.

Yellow Nabonnand, Yvonne Gravier.

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THE ROSE OF SHARON (*Hibiscus syriacus*).

OUR list of late-flowering shrubs is not a long one, and as the days dwindle and darken a gloom settles down upon shrubberies, which has been intensified by bad weather. Walking through gardens a few days since this dreariness was most apparent, until the eye was caught by a bright exception amid surrounding desolation, which proved to be a fine bush of the Syrian Mallow in full bloom. It was the only one to be seen and bore traces of the rainfall, but the large white flowers were a ray

of brightness and turned the thoughts into a happier channel. Though quite hardy in our country, this fine shrub does not bloom quite so well with us as in climates more nearly like that of its native haunts; but, if smaller and less numerous, its flowers are so beautiful, and borne during so many weeks in autumn, that, though an old-fashioned plant, it should not be confined to a few old-fashioned gardens. It thrives best in the free warm soils of our southern valleys, growing somewhat slowly, but in a sunny spot soon forming handsome bushes, often reaching 6 to 10 feet in height, with flowers either single or double, soon fading, but renewed freely throughout the autumn. In many parts of the Continent it is a favourite shrub, of which fine plants may be seen drooping over walls and half hiding wayside cottages. Fine varieties have been raised in recent years both in France and America, kinds superior in colour to many of the older sorts of poor effect; in those with single flowers this gain in colour is marked. The new double-flowered whites are good, but a little sensitive to cold, and for Britain not so useful as the single forms. Young plants may be raised from seed, but root-grafting is the common mode of increase. The following are the finest varieties:—

SINGLE-FLOWERED KINDS. — These are fewer and less grown than the doubles, though really more graceful and better for our English gardens. The wild Syrian shrub bears flowers of bluish-purple deepening to crimson toward the centre, but amongst seedling garden forms many colours are now represented. Two of the best new kinds are a fine red in colour, *rubis* being, as its name implies, a bright ruby-red with flowers well displayed, while the second plant, an unnamed seedling raised by Messrs. Baltet of Troyes, is even richer in colour. Of older sorts *totus albus*, a pure white, is perhaps the best of all, though *Celeste* and *cærulea*, both beautiful flowers shading to blue, are also very fine. There is a pretty single form of *grandiflora superba*, with large rose-flushed flowers; *monstruosa*, an even larger blossom, being white with a dark purplish centre. The best dark flowers, *Boule de feu* of reddish-purple, with *de la Veuve* and *atropurpurea* still darker, are sombre for autumn borders; more useful are *La Reine*, of a cheery rose colour, *speciosa* and its varieties of a more decided crimson, while

elegantissima is a good flower prettily flushed with pink. Other kinds are *fastuosa*, a rather distinct light violet; *amplissima*, in red and white; and *Duchesse de Brabant* with flowers of light rose.

DOUBLE-FLOWERED KINDS. — These are numerous and include flowers variously striped, tipped, and mottled, as well as forms held to resemble an Anemone, a Pæony, and a Ranunculus. A fine pure white variety has recently been raised in America under the name of *Admiral Dewey*, with large flowers, opening well, full and free, found to be superior to *Jeanne d'Arc* the previous purest white. *Ranunculiflora* has been a favourite but is not a pure white, while *alba pleno* is only white in part, the base of the petals shading to magenta purple. *Puniceus* is the best red; *Duc de Brabant* is also good in the same colour. Flowers in various shades of rose and carmine are *grandiflora superba*, *Alice*, and *carnea pleno*; while *Comte de Hamault*, *speciosa*, and *pulcherrima* show pretty blendings of pink and white. Of purple flowers are *Souvenir de Chas. Lebreton*, one of the best, in lilac shading to purple; *bicolor*, a blend of white and purple; *violette clair*, a pretty shade of mauve; and *Amaranta*, in lilac touched with red. There is also a sport from *bicolor* nearly blue in colour, and a pretty pale rose form of *Pæoniflora*. B.

INULA ROYLEANA.*

THIS life-size portrait of a flower comparatively new to cultivation in English gardens will be welcome to amateurs, who can form their own estimate of its merits without our here applying to it any epithets of praise or disparagement. Of the large genus *Inula*, of which the species are spread over the temperate regions of the Old World, few have found favour as ornamental plants. Those of any value in gardens may be reviewed as follows:—

Inula Helenium (Elecampane).—The type of the genus and a plant which has for many centuries been held in high esteem for the me-

dicinal virtues and culinary uses of its aromatic root. The Latin poet Horace, for example, mentions it as used to flavour sauce for lampreys, and also as a good restorative for a jaded stomach. Though a coarse plant for gardens it forms an excellent ornament for the side of a wild pond, where, if planted in deep soil close to the water, it grows 6 or 7 feet high, bearing large ornamental leaves and several flower-stems, each with a panicle of a dozen golden flowers nearly 4 inches across, outgrowing Nettles and Docks and asserting its presence very decidedly. Nearly allied to this in its thick and large foliaceous bracts is *I. royleana*, the subject of our coloured portrait.

I. royleana.—First described by De Candolle ("Prodromus," V., 464) about the year 1835, when it had been recently discovered by Royle in the Western Himalayas. I first saw it in the garden of Mr. A. K. Bulley, a few miles north of Chester. He had raised it from imported seed. The specimen figured was from the garden of Mr. Gumbleton in the south of Ireland. The flowers are generally solitary, and to find three on one stem is quite exceptional. The stalk is not more than a foot, or at most 18 inches high, very stout and slightly curved. The leaves end abruptly with a cordate base, are finely serrated, tapering to an obtuse tip, and are thick and conspicuously veined; the bracts, which are not shown in the portrait, are very broad and thick. I have little experience of its behaviour in cultivation except that it flowers early in July, so I say no more of it.

I. macrocephala.—This Caucasian species is described in Boissier's "Flora Orientalis" (Vol. III., p. 186). It is doubtfully marked by Sir J. Hooker as synonymous with *I. royleana*, but, having cultivated it at Edge for twenty years, I can say that it has obviously distinct characters. E. Boissier says that the head resembles that of *I. Helenium*, but is three times its size; this is far larger than I have ever seen it, but the foliose bracts are very broad and solid and form fully half the width of the flower-head; the disk is bright gold, nearly 2 inches across; between this and the involucre there rises a dense row of fine ligules, not more than half an inch high, at right angles to the disk and as even in length as if clipped with scis-

* With coloured plate from a drawing made at Belgrove, Queenstown, by H. G. Moon.



INULA F. JULI

sors. The stems, generally one-flowered, are about 3 feet high, directly ascending, having a few narrowly oblong alternate leaves, 6 inches long, tapering at both ends, not ending abruptly in a broad base like those of *royleana*. The flowers come in August when those of *royleana* are over.

I. grandiflora (Willdenow).—The finest and most ornamental species of the genus; from the Caucasus. This has been unfortunately divided into two species, and some confusion caused thereby. So we give a few references to original authorities, being convinced that a careful investigation of these will show that the one name of *grandiflora* ought to include the variety *glandulosa*, which is not a distinct species. The plant was first described by Tournefort before the end of the seventeenth century; then by M. Bieberstein in his "Flora Caucasica": he found the type growing mixed with its variety *glandulosa*, a name which has now usurped the front place which belongs by prior right to *I. grandiflora*. It was introduced into cultivation in England early in the last century by the botanist Don. There is an excellent portrait of it in *The Botanical Magazine*, tab. 1907 (A.D. 1817). It is there called *I. glandulosa*, but the description says that the more conspicuous glands on the tips of the serrature of the leaves, so well shown in that portrait, constitute the only character by which *glandulosa* differs from the typical species, *I. grandiflora*, of which it ought to be made a variety. Another less known coloured portrait of about the same date is in Edwards's "Botanical Register," Vol. IV., tab. 334. In that the glands at the edge of the leaves are not shown, so it has no excuse for being named *glandulosa* instead of *grandiflora*, but we have no authentic portrait of *I. grandiflora* under its proper name. However, the descriptions of De Candolle ("Prodromus," V., 468) and of E. Boissier ("Flora Orientalis," Vol. III., p. 185) plainly show that in the opinion of those eminent botanists these two so-called species are too near to be separated. In fact, both the type and the variety have glands at the edge of the leaves, though the portrait in *The Botanical Magazine* makes them more conspicuous.

I. grandiflora and var. *glandulosa*.—This fine plant has become general in England within the last twenty years. Several genera-

tions have been raised in Edge Hall gardens and elsewhere from seed which ripens abundantly, and the seedlings have shown so much variation in habit, stature, and flowers that nurserymen have made three species out of one. Some have a lax running root-habit; the height ranges from 2 to nearly 5 feet; the rays of the flower vary in length and are sometimes nearly horizontal but generally abruptly deflexed; the colour is a bright orange but varying in intensity. Those with the largest flowers have been made into *I. grandiflora*, perhaps correctly enough; but others with less cause have been named *I. Hookeri*, a name which belongs to no Caucasian type and will be described presently.

I. barbata.—One of two Himalayan species, which, though less attractive than the Caucasian forms, deserve notice, especially since they have been confused with them not only by nurserymen and amateurs but also by botanists. The first of these is *I. barbata*, so named by Wallich twenty years ago from a specimen in the herbarium of the East India Company. It is now common in English gardens either under the name of *I. oculus Christi*, or of *I. grandiflora*, both of them wrong, though there is justification for the last. The botanist Clarke when describing Himalayan plants seems to have mistaken *I. barbata* for *I. grandiflora*, and described it by that name, and in this he is followed by Sir J. Hooker ("Flora of British India," Vol. III., p. 294), the true *grandiflora* not being found in the Himalayas at all. Sir J. Hooker does not notice *I. barbata* by name though it is clearly described by De Candolle. I have failed to find any portrait of the plant.

I. Hookeri.—This is the other Himalayan *Inula* referred to above, and often misrepresented in English gardens. This species is figured and described by Sir J. Hooker in *The Botanical Magazine*, tab. 6411. The portrait shows a slighter and less ornamental flower than the Caucasian substitute, with fewer and more horizontal rays; having less orange tint in the yellow; stem about 15 inches high with lanceolate leaves and a broad rough involucre looking as though enveloped in moss. I had a specimen from Glasnevin Botanical Garden, the only one I have seen alive.

I. hirta.—A species from southern and central Europe, of about the same stature and

with flowers about the same size as the last described. It flowers in June, making a dense array of free-flowering stems mottled with dark brown. The leaves are broadly lanceolate and the whole plant scabrous.

I. ensifolia.—This species flowers a month later than *hirta*, has smooth and much narrower leaves, is hardly a foot high, and worth growing for its very neat flowers with regularly disposed horizontal rays.

Experienced amateur gardeners will be struck by the strong resemblance of the flowers in the coloured portrait of *I. royleana* to those of *Telekia speciosa* (Baumgartner), a genus now absorbed in *Bupthalmum*. This fine species of robust growth and invaluable for a wild garden bears stems 3 feet high in England, with large broad cordate leaves and panicles of ten or twelve flowers; in its native haunts on the Caucasus, as the mountaineer Mr. Freshfield tells us, it grows so luxuriantly that a man on horseback riding amongst it scarcely has his head and shoulders visible.

C. WOLLEY DOD.

Edge Hall, Malpas.

WISTARIAS AS STANDARDS AND BUSHES AND IN OTHER FORMS.

THIS, the most beautiful of all climbers ever introduced to this country, is usually left to itself as a huge liane; but it is really a most amenable plant, and well deserves to be grown in other ways, *e.g.*, as a standard occasionally, or as garlands, bushes, archways, and climbing up trees. Lovely effects are often seen on the Riviera from its free use in gardens, where many trees are completely wreathed in garlands of *Wistaria*, becoming clouds of blue tassels in April. It does especially well in trees of light leafage such as the Olive and False Pepper, the climber and its host drooping together in a very pretty way. It is also very effective creeping up the tall bare stem of a Pine, to hang in graceful festoons from the upper

branches, but in such case it is well not to allow the *Wistaria* to wind spirally upwards as is its wont, for on gaining strength the twisted stem tightens to such an extent as to injure its support. I have seen a great Pine so nearly killed by such strangulation that the climber had to be cut away to save it, the rope-like stems having sunk into the bark in all directions. Guided straight up the trunk, an occasional tie secures it from wind, and once among the branches it threads its own way, and droops without doing any harm. By using with it other climbers of good colour like the yellow climbing Roses such as *Bouquet d'Or*, *Reved'Or*, and the climbing *Cramoisi*, the most beautiful effects in colour are produced. For archways, porches, and verandahs, few climbers are so useful, and the ease with which straggling shoots may be layered and rooted to form the centre of fresh growth, enables one plant to cover a great surface. In this way a series of arches may be clothed in time, by layering at intervals any shoots that reach the ground, the new roots giving fresh growth and further extension. Into one such trained plant branches of other kinds had been grafted with good effect, the blue and white flowered sorts hanging in clusters side by side. The double flower was also used, but is less graceful in form and of a duller colour, quite inferior to the pale shaded blue of the single kind. The very long drooping bunches of *W. multijuga* are graceful and pretty, but it is not nearly so free as the common kind, and the flowers are smaller, of a duller purplish colour, and later in bloom.

But perhaps the most novel form of the *Wistaria* is that of a bush or small standard. Nothing is easier than to have even very small plants which every year will be covered with bloom, and when we see them closely these plants show a disposition to flower abundantly on the old wood. In fact, it is rare to see them flowering anywhere else but on the old wood, resembling in this respect the majority of fruit trees. We must therefore induce certain parts of these plants to mature their buds; this is easily done by breaking off the growing shoots a little above their insertion, so as to transform their base, as we do when we similarly break off the buds of Apple and Pear trees. If the shoots have not been broken off sufficiently short, we may, during the pruning season in spring, cut back almost to the old wood. So treated it is possible to have *Wistarias* which are not more than 5 feet in diameter and height, although over twenty years old. Every year at flowering time, notwithstanding this change of form, they disappear for a fortnight under a mass of bloom, and form one of the most beautiful effects. By planting alternately the forms with blue and white flowers we increase their beauty by the pleasing contrast of colour. French gardeners are particularly clever in their management of trained plants of all sorts, and though in some cases the natural beauty of the plant is spoiled by such treatment, this way of growing the *Wistaria* deserves to be better known, for few plants are finer in standard form, or more easily trained to it. There are indeed many ways of enjoying the beauty of this Queen of climbing shrubs. B.

THE EASTERN CYPRESS

(*Cupressus sempervirens*).

THIS lovely tree is, unfortunately, not very hardy in our country, and, although often planted in mild districts, it is seldom seen in others. But here and there we have been struck by its beauty; as lately at Ickworth in Suffolk, which at first sight might not seem to be a county in which one could expect this tree to attain to any size. But the trees at Ickworth are very fine and the effect they give to the garden quite distinct and charming. So that here we have encouragement that, where the soil is warm and free as in Suffolk, and the climate not too severe, this effect of the Eastern Cypress may be enjoyed. In our country it rarely grows to any great size, but there are trees in Italy and the East known to be many hundreds of years old (as at Rome and in Lombardy) and 100 feet or more in height, perfectly erect, and beautiful as in the Guisti Gardens at Verona. The received opinion now is that in all the countries where it now grows so freely, to the west of Greece and Turkey, it has been introduced. A statement by Pliny, that in his time there were standing at Rome some Cypresses that were even more ancient than the city itself, would seem rather to lead to the inference that our tree must have been native there; for although there had been some attempts at colonisation or settlement between Greece and Italy prior to the arrival of Æneas in Latium, they do not seem to have been of such a character as would have included horticulture as one of their elements. Still, on the other hand, Pliny tells us, without qualification, that the Cypress was introduced from Greece to Tarentum.

This Cypress has been grown in England for 300 years at least, but there are a few trees of great age. There are two varieties of this species distinguished by their habit of growth, a difference which becomes more distinct as the tree gets older, one upright the other spreading and forming, when old, something like a head. In former years it used to be a vexed question whether these two were distinct species or only varieties, but there is scarcely any question as to this now. We have become more familiar with the vagaries of the Cypress tribe, and we know that similar differ-

ences in habit may be seen in almost every species of Cypress. Anyone approaching the Mediterranean region for the first time cannot fail to be impressed by the form of the Cypress, towering in dark distinctness above the lower vegetation, its sharp outline often seen to advantage on rising ground. Upon the sunny side of the Alps it becomes a common tree around the graveyards and cemeteries, guarding the approach to village churches and wayside shrines, and forming stately avenues in gardens of the fine old houses of the south. Its stout stem, straight as an arrow, shoots up rapidly when young, frequently making a growth of several feet in a season. Its favourite spot is the sunnyslope of a hillside, safe from the stagnant moisture of the valley and with assured drainage; it prefers a limestone soil, free and fresh, but when mature is uninjured by long drought. As a protection from cold or heat there is nothing better than a double rank of Cypress, their height and dense growth giving shelter which neither wind nor snow can penetrate; gardens enclosed upon the wintry side by such a living wall, often 60 or more feet high, enjoy a climate of their own and shaded walks, when all outside is one intolerable glare. Yet to some the tree is unwelcome on account of its associations, or on the ground of its severely formal outline, while others would banish it because mosquitoes often hide in its dense cover. Still, an avenue of these trees is singularly beautiful, their regularity of growth and outline making a good result certain with little or no care, whilst isolated trees in their quaint distinctness stand out as landmarks of the most picturesque character; and if there be mosquitoes there are also the fire-flies flitting like myriad animated sparks in their shadow so soon as night falls. Though merging through intermediate forms, the spreading and upright kinds are very distinct in appearance, the pyramidal by far the more common, though in some places, as around Montpellier, where it forms fine avenues, the cone shape prevails; hence *horizontalis* is often called the "*tree of Montpellier*." The peasants invariably refer to this spreading and more handsome form as the *male*, and the slender, narrow form as the *female* Cypress, but the distinction is purely fanciful. Their wood, which is hard, finely grained, fragrant, and red or rose colour, is highly valued

and very lasting. The ancient gates of Constantinople made of this tree are said to have stood for more than a thousand years.

A COMMON FAULT IN GARDEN MAKING.

THERE is a practice in the London parks and elsewhere of raising mounds with the idea of getting better landscape effect, but as generally carried out it is against all good work in landscape gardening. It is assumed by the mound-makers that the ground is not right for their purpose, and so heaps of earth are thrown up here and there to change the natural form of the ground. Anyone going through St. James's Park will be able to judge for themselves whether anything is gained by this distortion of the surface. It will be clear to any observer that at least two things are lost. In the first place, those who made these mounds have rarely any eye for natural gradation, and therefore false lines and stiff banks occur here and there and are very unsightly. Secondly, piling mounds of earth around trees is a sure way of destroying one of the most beautiful aspects of tree life, and that is the way in which the stem arises from the earth, often with a wide spreading bole, or with a broad buttressed effect such as that shown in our illustration. In St. James's Park and the other places where this needless work has been done, the bottom of the tree is often hidden, so that it comes out of the ground like a stick. There is scarcely any place where trees grow naturally in which one cannot see the beautiful way in which their stems are built,—a form of beauty which should never be concealed by needless earthwork. Such

treatment of ground surface is common in France and some of its worst effects may be seen in the Champs Elysée, which is full of false lines, stiff banks, and beds made at impossible angles, and this poor result is ill-concealed by the beauty of the trees and the good planting. In valleys like those of the Thames and the Seine we only lose by altering the natural lie of the ground. There is no planting, either of flower or shrub, that is one whit advanced by the creation of artificial mounds, in a valley where the soil is generally good. The art of too many present-day landscape - gardeners consists very largely in this artificial chopping and changing of surface, often at great expense and with anything but a gain in real effect, and nowhere is the ugliness of these exaggerated distortions more seen than in many of the public parks and gardens, both here and abroad. It is true that where the ground is naturally broken, a slight change in surface may sometimes open up hidden beauty and give better effect, but to create artificial mounds for the mere sake of avoid-

ing a flat surface is a false idea of art. And whenever it is necessary in grading for walks or any other purpose, to change existing surfaces, special care should be



BASE OF BEECH IN KNOLE PARK.

taken to avoid this earthing up of tree-stems, which not only hides one of their finest features, but is often fatal to certain kinds of trees.

PROFESSOR TRELEASE ON YUCCA.

(Continued from page 286.)

Y. elephantipes (Regel).—Usually with several trunks from a swollen base similar to that of *Nolina*, rough barked in age. At length a large tree 25 or 30 feet high, compactly branched above. Leaves rigidly spreading, clear green, glossy, plane or a little plicate, with soft green tip, 1 to 3 feet long and 2 to 3 inches wide, scabrid-margined and sometimes a little roughened on the dorsal ridges. Inflorescence paniced close to the leaves, glabrous. Flowers white or creamy: style short, oblong. Fruit oblong-ovoid: seeds nearly circular. Central America, where it is universally cultivated, flowering from February to April, and common elsewhere in gardens; but the exact place of its nativity remains to be discovered. I find no material showing the native home of *Y. elephantipes*, but it appears to be in the eastern mountains of Mexico, where Schiede reported it as spontaneous. Though cultivated everywhere in the interior as a hedge or dooryard plant, it is not wild, as far as known, in Guatemala, nor in Honduras, and a gentleman who has travelled extensively in Salvador reports it as occurring in that republic only in cultivation. Doubtful reports locate it in the mining region of Honduras, and near the Atlantic coast about Bluefields, Nicaragua. In foliage it is much like *Y. Draconis*, the flowers of which, however, are different. It is probably this species which occurs, in small specimens, in the gardens of Belize, where the poetic negroes and Caribs call it "May-pole." Throughout Guatemala and Honduras this tree is known as "Izote," and while it is chiefly cultivated as a poor hedge plant, the flowers are prized as a vegetable and sold in the towns, the method of preparing them being to fry them with eggs. No use appears to be made of the leaf-fibre, other cordage materials being abundant and more easily worked.

Y. Trecaleana (Carrière).—A simple or loosely few-branched tree, usually under 15 feet high. Leaves thick and rigid, very concave, blue-green, shagreen-roughened, pungent, 3 to 4 feet long and 1 to 2 inches wide, brown margined, entire or irregularly denticulate, soon becoming sparingly and finely filiferous. In-

florescence usually short-stalked, glabrous with large bracts below. Flowers white, occasionally tinged with purple; style slightly contracted, short; stamens quickly hooked. Fruit oblong; south central Texas, southwards to Tampico. A distinct form of the species—which appears to be the "scattered palm" of the Mexicans—is known as *canaliculata*, being the broader-leaved plant of the coast region and foot hills from Texas to Mexico.

Y. Schottii (Engelmann).—Arborescent, rarely over 10 or 12 feet high, simple or few branched above. Leaves blue-green, smooth, rather rigidly divergent, thin, concave, pungent, 1 to 1½ inches wide, very finely and often sparingly filiferous. Inflorescence densely paniced close to the leaves, very tomentose or rarely nearly glabrous. Flowers sub-globose. Fruit oblong, mostly large. Southern Arizona, into the Mexican state of Chihuahua. Flowering in late summer. This Yucca becomes a small tree, most frequently unbranched, 6 to 8 feet high, and especially marked among the Yuccas of the region by the bluish-green colour and thinness of its smooth, brown-margined leaves. *Jaliscensis* is a stout large-branched variety, with leaves sometimes very large. Is otherwise scarcely distinguishable from the type, and, like it, blooming in late summer or autumn. Mexico, frequent in hedges but of uncertain spontaneous range.

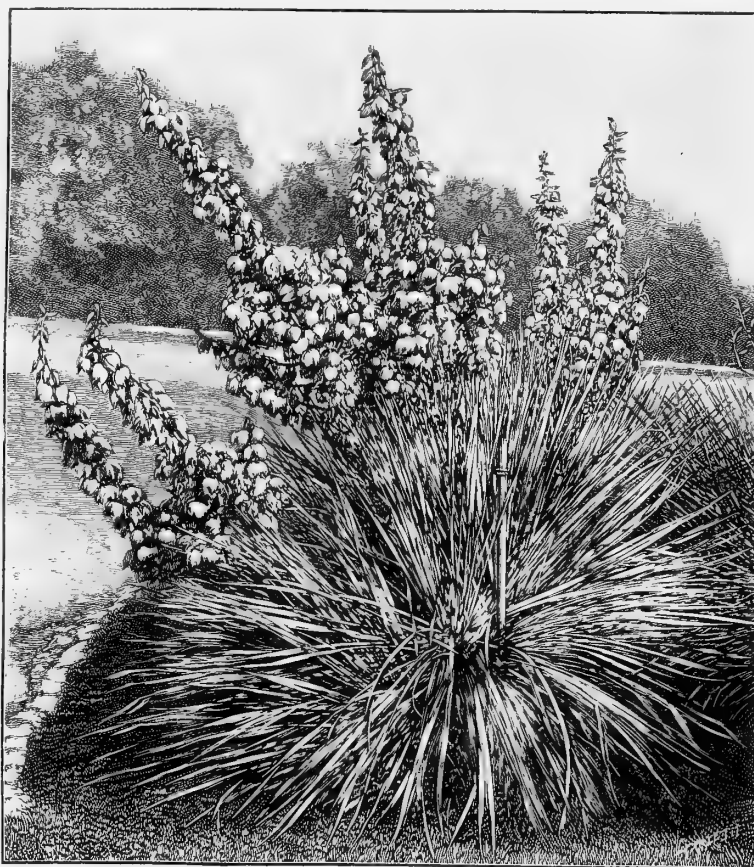
Y. brevifolia (Schott).—Shortly caulescent, scarcely reaching a height of 6 feet, mostly cespitose. Leaves green, smooth, rigidly divergent, often falcate, thick, plano-convex, very pungent, 1 to 2 feet long, ¼ to 1 inch wide, the margin freely filiferous. Inflorescence paniced close above the leaves, glabrous. Flowers apparently rather small, with tapering style. Fruit baccate, large. About Nogales, Arizona, on the Santa Cruz river, and in the rugged mountains west of that city; flowers in May. The leaves vary much, particularly in width.

Y. australis (Engelmann).—A large, thick, and rough-stemmed tree, at length much branched. Leaves rigidly spreading, pungently stout pointed, green, usually about 1 foot long and 1 inch wide, but occasionally of double these dimensions, thick, plano or concave-convex, smooth or exceptionally a little scabrid on the dorsal angles, somewhat sparingly rather coarsely filiferous. Inflorescence on an

exserted peduncle, oblong, pendent, with pendent branches, glabrous. Flowers creamy white, rather small; style short, constricted, stigma deeply six-lobed. Tablelands of Mexico. One of the large tree Yuccas of northern Mexico, which are locally called palmas, in contrast with the smaller narrow-leaved species, like *Ys. rostrata* and *radiosa*, which are known by the diminutive names palmita or palmilla. *Y. australis* forms large forests in the valleys about Monterey, and is especially abundant to the north of that city, and though there are many breaks, these forests continue in open places along the Mexican National railroad as far south as the city of Mexico, and it is found in some quantity toward Puebla, on the Mexican southern road. On the Central railroad it is seen, accompanied by *Y. Treculeana* and *Y. rigida*, in varying quantity in a few places. Throughout this large area *australis* is distinguished from its congeners by a long narrow panicle hanging straight down from the cluster of leaves, on a quickly arched base; and as this character is as marked in the fruiting clusters as in the flower clusters, the recognition of the species is very easy throughout the territory in which it grows. Typically it becomes a large loosely-branched rough-barked tree, but in cultivation it often attains gigantic proportions before branching, with an extent of many feet of the trunk covered by still green leaves. In the high dry region along the Tropic of Cancer, a low short-branched form occurs, sometimes not over 10 or 12 feet high, but with a trunk 3 feet or more in diameter.

Y. valida (Brandege).—Similar in dimensions, habit, foliage, floral details and fruit, to the preceding. Inflorescence broadly ovoid, close to the leaves, continuous in direction with the branch, hence either erect, horizontal, ascending or downwardly turned. Central Lower California, and on the high tableland of Central Mexico. About Durango, Mexico, in April 1900, I observed Yuccas of the simpler trunk form assumed by *Y. australis*, and with similar foliage and flowers, but noticeable by their short and spreading panicles, markedly different from

the elongated and pendent flower-clusters of the latter species. So far as inflorescence could be seen, this proved to be the only species of this type along the Mexican Central railroad between about Canitas and Chicalote, and it forms great forests on the elevated red lands about Gutierrez, Fresnillo, and Calera, where it often assumes the low compact form noted as *Y. australis* to the eastward in the same latitude, some of the short main trunks measuring fully 6 feet in diameter. Because of the curly threads on its leaf margin, it is known as the "curly Yucca,"



YUCCA IN FLOWER.

Engraved for "Flora" from a photograph sent by Professor Trelease.

and towards San Louis Potosi it is associated with *Y. australis*, which appears to be entirely absent from the highlands, though it replaces *Y. valida* to the east.

Y. baccata (Torrey).—A low species, usually from a stout prostrate short-branched caudex. Leaves rigidly spreading, bluish green, about 2 feet long and 2 inches wide, concave, shagreen-roughened, narrowly brown-bordered, coarsely filiferous. Flowers very large for the genus, oblong-campanulate, the lanceolate segments about 3 inches; style slender, elongated,

gradually tapering; stigmatic lobes short. Fruit very large (as much as 8 inches long), mostly conical-ovoid, with adnate calyx-disk and filament bases. Trinidad, Colorado, and west to southern Nevada. The first discovered of the western fleshy-fruited Yuccas, differing from the species which have been confounded with it in its prostrate caudex, the crowns of which rarely rise much above the earth, its large pendent flowers, and its conical large fruit with the base of the perianth adnate as a conspicuous disk, and the bases of the filaments forming fleshy papillæ, as in *Y. aloifolia*. The *Y. baccata* of the Pacific coast is what is here called *Y. Mohavensis*.

Y. macrocarpa (Torrey). — Arborescent, sub-simple, becoming 10 to 15 feet high. Leaves yellowish green, $1\frac{1}{2}$ to 3 feet long, $1\frac{1}{2}$ to 2 inches wide, usually rough, concave, coarsely filiferous. Panicle glabrous or occasionally pubescent, the bracts at first often brownish. Flowers mostly more globose and smaller, the perianth segments usually nearly 2 inches long. Fruit oblong, not so large as in the preceding. Las Cruces, to the Dragoon Pass, Arizona, northern Chihuahua, and vicinity of Presidio. When seen from a distance resembles *Y. Treculeana*, though usually of a yellower-green foliage. The trunk very rarely branches, and is usually 6 to 10 feet high, though occasionally specimens are seen exceeding 15 feet. Its concave stiff leaves are usually 2 or 3 feet long and about 2 inches wide, and, as in *Y. baccata*, they are rough like shagreen on the back, and frequently on both, surfaces, and very coarsely grey filiferous. The fruit varies greatly in form and size.

Y. Mohavensis (Sargent). — With habit and general characters of the preceding. Style very short, contracted. Fruit mostly smaller. Western Arizona, southern Nevada, and California. The principal difference between this and the preceding lies in the style, which is contracted and short in the one, and elongated in the other, but the great area of desert country lying between their respective localities makes it desirable to class them as distinct species.

Mr. Trelease concludes with a few interesting notes upon the economic uses, and reproductory peculiarities of the Yuccas:—

“The Yuccæ possess very fibrous leaves and local use is made of the fibre almost every-

where that the plants grow. In the southeastern United States, and as far as the Indian Territory, the leaves of species of Yucca of the *filamentosa* group, commonly called ‘bear-grass,’ are much used for such work as making seats for chairs and especially hanging meat, for which they are so much prized in the country that the plants are tolerated as weeds in cultivated fields. In Mexico and our southwestern states the fibre of several of the baccate species is crudely cleaned and put to various local uses, cordage included. The long leaves of “palma local” (*Y. Treculeana*), with coarse fibre, and “izote” (*Y. Schottii Jaliscensis*), with fine fibre, are apparently of considerable use in this manner, respectively in the eastern and western parts of Mexico.

“The pollination relations of nearly all of the group are among the most peculiar and restricted thus far discovered. *Y. aloifolia* in an exceptional way appears to be freely self-fertile, but self-seeding is very unusual with all of the other species of this genus. These, so far as is known, depend for their pollination upon small moths belonging to the tineid genus *Pro-nuba*. These moths are not known to feed in the larval stage on anything but the developing seeds of the plants named; so that the mutual dependence of moth upon plant and of plant upon moth appears to be absolute. The rainfall, which stimulates the flowering of the Yuccas, invariably induces the appearance of these grubs, even though they may have been absent through several dry seasons. The bearing and meaning of this fact has as yet escaped both botanists and entomologists. That the flowers were formerly pollinated otherwise appears certain from the presence of nectar-glands which now appear to be useless.”

From this genus, as now limited by Professor Trelease, are separated the beautiful *Y. Whipplei* of California, which is frequently cultivated in Europe—this is placed in the genus *Hesperoyucca*; the large “Joshua-tree” of the Mohave Desert—*Y. brevifolia* of Engelmann, which is now called *Clistoyucca arborescens*; and, perhaps the most beautiful of all the Yucca-like plants, a tree from the mountains below Saltillo, Mexico, with large Tuberosa-like flowers, which is made the type of a new group *Samuela*, under the name of *S. Garnerosana*.

I N D E X.

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